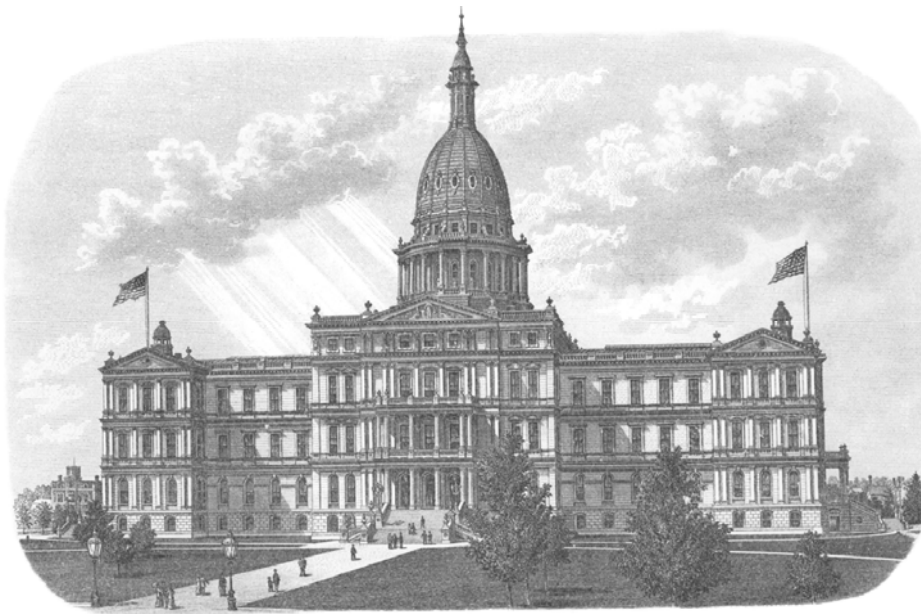


Michigan Register

Issue No. 19 – 2013 (Published November 1, 2013)



GRAPHIC IMAGES IN THE MICHIGAN REGISTER

COVER DRAWING

Michigan State Capitol:

This image, with flags flying to indicate that both chambers of the legislature are in session, may have originated as an etching based on a drawing or a photograph. The artist is unknown. The drawing predates the placement of the statue of Austin T. Blair on the capitol grounds in 1898.

(Michigan State Archives)

PAGE GRAPHICS

Capitol Dome:

The architectural rendering of the Michigan State Capitol's dome is the work of Elijah E. Myers, the building's renowned architect. Myers inked the rendering on linen in late 1871 or early 1872. Myers' fine draftsmanship, the hallmark of his work, is clearly evident.

Because of their size, few architectural renderings of the 19th century have survived. Michigan is fortunate that many of Myers' designs for the Capitol were found in the building's attic in the 1950's. As part of the state's 1987 sesquicentennial celebration, they were conserved and deposited in the Michigan State Archives.

(Michigan State Archives)

East Elevation of the Michigan State Capitol:

When Myers' drawings were discovered in the 1950's, this view of the Capitol – the one most familiar to Michigan citizens – was missing. During the building's recent restoration (1989-1992), this drawing was commissioned to recreate the architect's original rendering of the east (front) elevation.

(Michigan Capitol Committee)

Michigan Register

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(This issue, published November 1, 2013, contains
documents filed from October 1, 2013 to October 15, 2013)

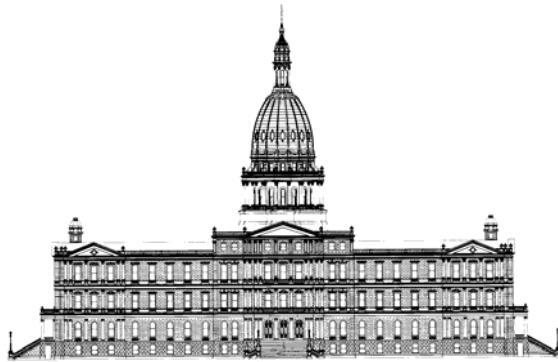
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Steve Arwood, Director, Office of Regulatory Reinvention; **Deidre O’Berry**, Administrative Rules Specialist for Operations and Publications.

Rick Snyder, Governor



Brian Calley, Lieutenant Governor

PREFACE

PUBLICATION AND CONTENTS OF THE MICHIGAN REGISTER

The Office of Regulatory Reform publishes the *Michigan Register*.

While several statutory provisions address the publication and contents of the *Michigan Register*, two are of particular importance.

24.208 Michigan register; publication; cumulative index; contents; public subscription; fee; synopsis of proposed rule or guideline; transmitting copies to office of regulatory reform.

Sec. 8.

(1) The office of regulatory reform shall publish the Michigan register at least once each month. The Michigan register shall contain all of the following:

- (a) Executive orders and executive reorganization orders.
 - (b) On a cumulative basis, the numbers and subject matter of the enrolled senate and house bills signed into law by the governor during the calendar year and the corresponding public act numbers.
 - (c) On a cumulative basis, the numbers and subject matter of the enrolled senate and house bills vetoed by the governor during the calendar year.
 - (d) Proposed administrative rules.
 - (e) Notices of public hearings on proposed administrative rules.
 - (f) Administrative rules filed with the secretary of state.
 - (g) Emergency rules filed with the secretary of state.
 - (h) Notice of proposed and adopted agency guidelines.
 - (i) Other official information considered necessary or appropriate by the office of regulatory reform.
 - (j) Attorney general opinions.
 - (k) All of the items listed in section 7(m) after final approval by the certificate of need commission under section 22215 of the public health code, 1978 PA 368, MCL 333.22215.
- (2) The office of regulatory reform shall publish a cumulative index for the Michigan register.
- (3) The Michigan register shall be available for public subscription at a fee reasonably calculated to cover publication and distribution costs.
- (4) If publication of an agency's proposed rule or guideline or an item described in subsection (1)(k) would be unreasonably expensive or lengthy, the office of regulatory reform may publish a brief synopsis of the proposed rule or guideline or item described in subsection (1)(k), including information on how to obtain a complete copy of the proposed rule or guideline or item described in subsection (1)(k) from the agency at no cost.
- (5) An agency shall electronically transmit a copy of the proposed rules and notice of public hearing to the office of regulatory reform for publication in the Michigan register.

4.1203 Michigan register fund; creation; administration; expenditures; disposition of money received from sale of Michigan register and amounts paid by state agencies; use of fund; price of Michigan register; availability of text on internet; copyright or other proprietary interest; fee prohibited; definition.

Sec. 203.

- (1) The Michigan register fund is created in the state treasury and shall be administered by the office of regulatory reform. The fund shall be expended only as provided in this section.
- (2) The money received from the sale of the Michigan register, along with those amounts paid by state agencies pursuant to section 57 of the administrative procedures act of 1969, 1969 PA 306, MCL 24.257, shall be deposited with the state treasurer and credited to the Michigan register fund.
- (3) The Michigan register fund shall be used to pay the costs of preparing, printing, and distributing the Michigan register.
- (4) The department of management and budget shall sell copies of the Michigan register at a price determined by the office of regulatory reform not to exceed the cost of preparation, printing, and distribution.
- (5) Notwithstanding section 204, beginning January 1, 2001, the office of regulatory reform shall make the text of the Michigan register available to the public on the internet.
- (6) The information described in subsection (5) that is maintained by the office of regulatory reform shall be made available in the shortest feasible time after the information is available. The information described in subsection (5) that is not maintained by the office of regulatory reform shall be made available in the shortest feasible time after it is made available to the office of regulatory reform.
- (7) Subsection (5) does not alter or relinquish any copyright or other proprietary interest or entitlement of this state relating to any of the information made available under subsection (5).
- (8) The office of regulatory reform shall not charge a fee for providing the Michigan register on the internet as provided in subsection (5).
- (9) As used in this section, "Michigan register" means that term as defined in section 5 of the administrative procedures act of 1969, 1969 PA 306, MCL 24.205.

CITATION TO THE MICHIGAN REGISTER

The *Michigan Register* is cited by year and issue number. For example, 2001 MR 1 refers to the year of issue (2001) and the issue number (1).

CLOSING DATES AND PUBLICATION SCHEDULE

The deadlines for submitting documents to the Office of Regulatory Reinvention for publication in the *Michigan Register* are the first and fifteenth days of each calendar month, unless the submission day falls on a Saturday, Sunday, or legal holiday, in which event the deadline is extended to include the next day which is not a Saturday, Sunday, or legal holiday. Documents filed or received after 5:00 p.m. on the closing date of a filing period will appear in the succeeding issue of the *Michigan Register*.

The Office of Regulatory Reinvention is not responsible for the editing and proofreading of documents submitted for publication.

Documents submitted for publication should be delivered or mailed in an electronic format to the following address: MICHIGAN REGISTER, Office of Regulatory Reinvention, Romney Building – Fourth Floor, 111 S. Capitol Avenue, Lansing, MI 48933

RELATIONSHIP TO THE MICHIGAN ADMINISTRATIVE CODE

The *Michigan Administrative Code* (1979 edition), which contains all permanent administrative rules in effect as of December 1979, was, during the period 1980-83, updated each calendar quarter with the publication of a paperback supplement. An annual supplement contained those permanent rules, which had appeared in the 4 quarterly supplements covering that year.

Quarterly supplements to the Code were discontinued in January 1984, and replaced by the monthly publication of permanent rules and emergency rules in the *Michigan Register*. Annual supplements have included the full text of those permanent rules that appear in the twelve monthly issues of the *Register* during a given calendar year. Emergency rules published in an issue of the *Register* are noted in the annual supplement to the Code.

SUBSCRIPTIONS AND DISTRIBUTION

The *Michigan Register*, a publication of the State of Michigan, is available for public subscription at a cost of \$400.00 per year. Submit subscription requests to: Office of Regulatory Reinvention, Romney Building – Fourth Floor, 111 S. Capitol Avenue, Lansing, MI 48933. Checks Payable: State of Michigan. Any questions should be directed to the Office of Regulatory Reinvention (517) 335-8658.

INTERNET ACCESS

The *Michigan Register* can be viewed free of charge on the Internet web site of the Office of Regulatory Reinvention: www.michigan.gov/orr.

Issue 2000-3 and all subsequent editions of the *Michigan Register* can be viewed on the Office of Regulatory Reinvention Internet web site. The electronic version of the *Register* can be navigated using the blue highlighted links found in the Contents section. Clicking on a highlighted title will take the reader to related text, clicking on a highlighted header above the text will return the reader to the Contents section.

Steve Arwood, Director
Office of Regulatory Reinvention

2013 PUBLICATION SCHEDULE

Issue No.	Closing Date for Filing or Submission Of Documents (5 p.m.)	Publication Date
1	January 15, 2013	February 1, 2013
2	February 1, 2013	February 15, 2013
3	February 15, 2013	March 1, 2013
4	March 1, 2013	March 15, 2013
5	March 15, 2013	April 1, 2013
6	April 1, 2013	April 15, 2013
7	April 15, 2013	May 1, 2013
8	May 1, 2013	May 15, 2013
9	May 15, 2013	June 1, 2013
10	June 1, 2013	June 15, 2013
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23	December 15, 2013	January 1, 2014
24	January 1, 2014	January 15, 2014

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ADMINISTRATIVE RULES
FILED WITH THE SECRETARY OF STATE

MCL 24.208 states in part:

“Sec. 8. (1) The Office of Regulatory Reinvention shall publish the Michigan register at least once each month. The Michigan register shall contain all of the following:

* * *

(f) Administrative rules filed with the secretary of state.”

ADMINISTRATIVE RULES

DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS

DIRECTOR'S OFFICE

PROFESSIONAL ENGINEERS – GENERAL RULES

Filed with the Secretary of State on October 10, 2013

These rules become effective immediately upon filing with the Secretary of State unless adopted under section 33, 44, or 45a(6) of 1969 PA 306. Rules adopted under these sections become effective 7 days after filing with the Secretary of State.

(By authority conferred on the board by section 308 of 1980 PA 299, MCL 339.308 and on the director of the department of licensing and regulatory affairs by sections 205 and 2009 of 1980 PA 299, MCL 339.205 and 339.2009 and Executive Reorganization Order Nos. 1996-2, 2003-1, 2011-4, MCL 445.2001, MCL 445.2011, and MCL 445.2030)

R 339.16001 of the Michigan Administrative Code is amended, and R 339.16040, R 339.16041, R 339.16042, R 339.16043, and R 339.16044 are added as follows:

PART 1. GENERAL PROVISIONS

R 339.16001 Definitions.

Rule 1. (1) As used in these rules:

- (a) "Act" means 1980 PA 299, MCL 339.101 to 339.2919.
 - (b) "Board" means the board of professional engineers.
 - (c) "Department" means the department of licensing and regulatory affairs.
 - (d) "Continuing education" means an instructional course or activity designed to bring licensees up to date on a particular area of knowledge or skills relevant to a licensee's area of professional practice.
 - (e) "Course" means any qualifying activity with a clear purpose and objective that will maintain, improve, or expand the skills and knowledge relevant to the licensee's area of professional practice. Regular duties for compensation shall not be considered qualified activities, except for employer compensated continuing education activities.
 - (f) "Distance learning" means any of the following:
 - (i) Courses where an instructor and a licensee may be apart and instruction takes place through online or electronic media.
 - (ii) Courses which include, but are not limited to, instruction presented through interactive classrooms, at the job site, computer conferencing, and interactive computer systems.
- (2) Terms defined in the act have the same meanings when used in these rules.

PART 4. CONTINUING EDUCATION

R 339.16040 Continuing education; license renewal; requirements.

Rule 40. (1) A licensee shall obtain continuing education, as specified in R 339.16042.

(2) A licensee shall certify the completion of continuing education requirements as a condition for licensure renewal in a format prescribed by the department.

(3) The department shall not renew a license if the continuing education requirements have not been completed.

(4) A licensee shall submit to the department evidence of fulfillment of the continuing education requirements within 45 days of a request from the department for the evidence to be submitted.

R 339.16041 Acceptable continuing education; limitations.

Rule 41. (1) Continuing education hours may be acquired in another jurisdiction.

(2) Continuing education hours shall be relevant to the occupation and may be earned as follows:

(a) Successfully completing a college course.

(b) Successfully completing a continuing education course.

(c) Successfully completing a distance learning course.

(d) Presenting or attending a seminar, in-house course, workshop, or professional or technical presentation made at a meeting, convention, or conference.

(e) Teaching, instructing, or presenting an acceptable course or activity listed in subrule 2(a) to (d) of this rule.

(f) Publishing a peer-reviewed paper, article, or book in the licensee's area of professional practice.

(g) Serving as a member of the state board of professional engineers or attending a state board of professional engineers meeting.

(h) Participating in a company sponsored seminar or training that is designed to enhance professional development in the licensee's area of professional practice.

(i) Serving as a mentor to an engineering student in a school-sponsored program.

(j) Obtaining patents related to engineering.

(3) Continuing education hours shall be granted once during a renewal period in which the hours were earned for the same course or activity that a licensee completed as either a licensee, instructor, or presenter.

(4) Continuing education hours shall be granted once for the first time a course is offered or presented provided that the course is not associated with a licensee's regular duties as a member of a faculty.

(5) Continuing education hours shall not be earned for any of the following activities:

(a) Passing an examination to obtain licensure.

(b) Completing a course that does not provide a licensee access to an instructor during the course.

(c) Completing a course that is not designed to bring licensees up to date on a particular area of knowledge or skills in the licensee's area of professional practice.

(d) Attending a cultural performance, entertainment, or recreational meeting or activity, or participation in a travel group.

(6) The conversion of other units of credit per renewal cycle shall be as follows:

(a) 1 college semester credit hour equals 45 continuing education hours.

(b) 1 college quarter credit hour equals 30 continuing education hours.

(c) Publishing a peer-reviewed paper, article, or book in the licensee's area of professional practice equals 6 continuing education hours.

(d) Serving as a member of the state board of professional engineers or attending a state board of professional engineers meeting equals 2 continuing education hours.

(e) Serving as a mentor for an engineering student in a school-sponsored program equals 4 continuing education hours.

(f) Obtaining patents related to engineering equals 10 continuing education hours.

R 339.16042 Continuing education hours required; renewal.

Rule 42. Continuing education hours required for renewal shall be as follows:

- (a) A licensee who holds a license for more than 12 months, but less than 24 months from the date of initial licensure shall obtain 15 hours of continuing education for the first renewal period.
- (b) A licensee who holds a license for 24 months or more from the date of initial licensure shall obtain 30 hours of continuing education for the renewal period.

R 339.16043 Determination of credit; forms; record keeping.

Rule 43. A licensee shall maintain records of continuing education hours earned for 4 consecutive years. The records shall include the following:

- (a) The courses or activities completed, the dates when the courses or activities were held and the duration of the courses or activities, the sponsoring organization, the instructor's or speaker's name, and the hours earned.
- (b) Verification of attendance at a course or activity, such as completion certificates or other supporting documentation.

R 339.16044 Auditing.

Rule 44. The department may establish a process for auditing licensees regarding continuing education for compliance with the act and these rules.

ADMINISTRATIVE RULES

DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS

DIRECTOR'S OFFICE

PROFESSIONAL SURVEYORS – GENERAL RULES

Filed with the Secretary of State on October 10, 2013

These rules become effective immediately upon filing with the Secretary of State unless adopted under section 33, 44, or 45a(6) of 1969 PA 306. Rules adopted under these sections become effective 7 days after filing with the Secretary of State.

(By authority conferred on the board by section 308 of 1980 PA 299, MCL 339.308 and on the director of the department of licensing and regulatory affairs by sections 205 and 2009 of 1980 PA 299, MCL 339.205 and 339.2009 and Executive Reorganization Order Nos. 1996-2, 2003-1, 2011-4, MCL 445.2001, MCL 445.2011, and MCL 445.2030)

R 339.17101 of the Michigan Administrative Code is amended, and R 339.17505, R 339.17506, R 339.17507, R 339.17508, and R 339.17509 are added as follows:

PART 1. GENERAL PROVISIONS

R 339.17101 Definitions.

Rule 101. (1) As used in these rules:

- (a) "Act" means 1980 PA 299, being MCL 339.101 to 339.2919.
 - (b) "Board" means the Michigan board of professional surveyors.
 - (c) "Department" means the department of licensing and regulatory affairs.
 - (d) "Continuing education" means an instructional course or activity designed to bring licensees up to date on a particular area of knowledge or skills relevant to a licensee's area of professional practice.
 - (e) "Course" means any qualifying activity with a clear purpose and objective that will maintain, improve, or expand the skills and knowledge relevant to the licensee's area of professional practice. Regular duties for compensation shall not be considered qualified activities, except for employer compensated continuing education activities.
 - (f) "Distance learning" means any of the following:
 - (i) Courses where an instructor and a licensee may be apart and instruction takes place through online or electronic media.
 - (ii) Courses which include, but are not limited to, instruction presented through interactive classrooms, at the job site, computer conferencing, and interactive computer systems.
- (2) Terms defined in the act have the same meanings when used in these rules.

PART 5. CONTINUING EDUCATION

R 339.17505 Continuing education; license renewal; requirements.

Rule 505. (1) A licensee shall obtain continuing education as specified in R 339.17507.

(2) A licensee shall certify the completion of continuing education requirements as a condition for licensure renewal in a format prescribed by the department.

(3) The department shall not renew a license if the continuing education requirements have not been completed.

(4) A licensee shall submit to the department evidence of fulfillment of the continuing education requirements within 45 days of a request from the department for the evidence to be submitted.

R 339.17506 Acceptable continuing education; limitations.

Rule 506. (1) Continuing education hours may be acquired in another jurisdiction.

(2) Continuing education hours shall be relevant to the occupation and may be earned as follows:

(a) Successfully completing a college course.

(b) Successfully completing a continuing education course.

(c) Successfully completing a distance learning course.

(d) Presenting or attending a seminar, in-house course, workshop, or professional or technical presentation made at a meeting, convention or conference.

(e) Teaching, instructing, or presenting an acceptable course or activity listed in subrule 2(a) to (d) of this rule.

(f) Publishing a peer-reviewed paper, article, or book in the licensee's area of professional practice.

(g) Serving as a member of the state board of professional surveyors or attending a state board of professional surveyors meeting.

(h) Participating in a company sponsored seminar or training that is designed to enhance professional development in the licensee's area of professional practice.

(i) Serving as a mentor to a surveying student in a school-sponsored program.

(j) Obtaining patents related to surveying.

(3) Continuing education hours shall be granted once during a renewal period in which the hours were earned for the same course or activity that a licensee completed as either a licensee, instructor, or presenter.

(4) Continuing education hours shall be granted once for the first time a course is offered or presented provided that the course is not associated with a licensee's regular duties as a member of a faculty.

(5) Continuing education hours shall not be earned for the following activities:

(a) Passing an examination to obtain licensure.

(b) Completing a course that does not provide a licensee access to an instructor during the course.

(c) Completing a course that is not designed to bring licensees up to date on a particular area of knowledge or skills in the licensee's area of professional practice.

(d) Attending a cultural performance, entertainment, or recreational meeting or activity, or participation in a travel group.

(6) The conversion of other units of credit per renewal cycle shall be as follows:

(a) 1 college semester credit hour equals 45 continuing education hours.

(b) 1 college quarter credit hour equals 30 continuing education hours.

(c) Publishing a peer-reviewed paper, article, or book in the licensee's area of professional practice equals 10 continuing education hours.

(d) Serving as a member of the state board of professional surveyors or attending a state board of professional surveyors meeting equals 2 continuing education hours.

(e) Serving as a mentor for a surveying student in a school-sponsored program equals 4 continuing education hours.

(f) Obtaining patents related to surveying equals 10 continuing education hours.

R 339.17507 Continuing education hours required; renewal.

Rule 507. Continuing education hours required for renewal shall be as follows:

- (a) A licensee who holds a license for more than 12 months, but less than 24 months from the date of initial licensure shall obtain 15 hours of continuing education for the first renewal period.
- (b) A licensee who holds a license for 24 months or more from the date of initial licensure shall obtain 30 hours of continuing education for the renewal period.

R 339.17508 Determination of credit; forms; record keeping.

Rule 508. A licensee shall maintain records of continuing education hours earned for 4 consecutive years. The records shall include the following:

- (a) The courses or activities completed, the dates when the courses or activities were held and the duration of the courses or activities, the sponsoring organization, the instructor's or speaker's name, and the hours earned.
- (b) Verification of attendance at a course or activity, such as completion certificates or other supporting documentation.

R 339.17509 Auditing.

Rule 509. The department may establish a process for auditing licensees regarding continuing education for compliance with the act and these rules.

ADMINISTRATIVE RULES

DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS

DIRECTOR'S OFFICE

ARCHITECTS - GENERAL RULES

Filed with the Secretary of State on October 10, 2013

These rules become effective immediately upon filing with the Secretary of State unless adopted under section 33, 44, or 45a(6) of 1969 PA 306. Rules adopted under these sections become effective 7 days after filing with the Secretary of State.

(By authority conferred on the board by section 308 of 1980 PA 299, MCL 339.308 and on the director of the department of licensing and regulatory affairs by sections 205 and 2009 of 1980 PA 299, MCL 339.205 and MCL 339.2009 and Executive Reorganization Order Nos. 1996-2, 2003-1, 2003-1, 2011-4, MCL 445.2001, MCL 445.2011, and MCL 445.2030)

R 339.15101 of the Michigan Administrative Code is amended, and R 339.15501, R 339.15502, R 339.15503, R 339.15504, R 339.15505, R 339.15506, and R 339.15507 are added as follows:

R 339.15101 Definitions.

Rule 101. (1) As used in these rules:

- (a) "Act" means 1980 PA 299, MCL 339.101 to 339.2919.
- (b) "Authorized representative" means the chairperson, vice chairperson, or other member of the board or employee of the department as the board may formally designate.
- (c) "Board" means the board of architects.
- (d) "Department" means the department of licensing and regulatory affairs.
- (e) "Continuing education" means an instructional course or activity designed to bring licensees up to date on a particular area of knowledge or skills relevant to a licensee's area of professional practice.
- (f) "Course" means any qualifying activity with a clear purpose and objective that will maintain, improve, or expand the skills and knowledge relevant to the licensee's area of professional practice. Regular duties for compensation shall not be considered activities, except for employer compensated continuing education activities.
- (g) "Distance learning" means any of the following:
 - (i) Courses where an instructor and a licensee may be apart and instruction takes place through online or electronic media.
 - (ii) Courses which include, but are not limited to, instruction presented through interactive classrooms, at the job site, computer conferencing, and interactive computer systems.
 - (iii) Monographs which include an online quiz or test offered by a sponsor that may not require an instructor.
- (h) "HSW subjects" means technical and professional subjects, relevant to the practice of architecture, which contain elements that will enhance the public's health, safety, and welfare.
- (i) "Monograph" means a distance learning course that examines or investigates current and emerging topics in architecture.

- (j) “Sponsor” means a person who represents to the public that any of its courses fulfill the requirements of section 2009 of the act for continuing education.
- (2) Terms defined in the act have the same meanings when used in these rules.

PART 5. CONTINUING EDUCATION

R 339.15501 Continuing education; license renewal; requirements.

Rule 501. (1) A licensee shall obtain continuing education in HSW subjects as specified in R 339.15503.

(2) A licensee shall certify the completion of continuing education requirements as a condition for licensure renewal in a format prescribed by the department.

(3) The department shall not renew a license if the continuing education requirements have not been completed.

(4) A licensee shall submit to the department evidence of fulfillment of the continuing education requirements within 45 days of a request from the department for the evidence to be submitted.

R 339.15502 Acceptable continuing education; limitations.

Rule 502. (1) Continuing education may be acquired in another jurisdiction.

(2) Continuing education hours in HSW subjects may be earned as follows:

- (a) Successfully completing a college course.
 - (b) Successfully completing a continuing education course.
 - (c) Successfully completing a distance learning course.
 - (d) Presenting or attending a seminar, in-house course, workshop, or professional or technical presentation made at a meeting, convention, or conference.
 - (e) Teaching, instructing, or presenting an acceptable course or activity listed in subrule 2(a) to (d) of this rule.
 - (f) Publishing a peer-reviewed paper, article, or book in the licensee’s area of professional practice.
 - (g) Serving as a member of the state board of architects or attending a state board of architects’ meeting.
 - (h) Participating in a company sponsored seminar or training to that is designed to enhance professional development in the licensee’s area of professional practice.
- (3) Continuing education hours shall be granted once during a renewal period in which the hours were earned for the same course or activity that a licensee completed as a participant, instructor, or presenter.
- (4) Continuing education hours shall be granted once for the first time a course is offered or presented provided that the course is not associated with a licensee’s regular duties as a member of a facility.
- (5) Continuing education hours shall not be earned for any of the following activities:
- (a) Passing an examination to obtain licensure.
 - (b) Completing a course that is not designed to bring licensees up to date on a particular area of knowledge or skills in the licensee’s area of professional practice.
 - (c) Attending a cultural performance, entertainment, or recreational meeting or activity, or participation in a travel group.
- (6) The conversion of other units of credit per renewal cycle shall be as follows:
- (a) 1 college semester credit hour equals 45 continuing education hours.
 - (b) 1 college quarter credit hour equals 30 continuing education hours.
 - (c) Publishing a peer-reviewed paper, article, or book in the licensee’s area of professional practice equals 6 continuing education hours.

(d) Serving as a member of the state board of architects or attending a state board of architects' meeting equals 2 continuing education hours.

R 339.15503 Continuing education hours required; renewal.

Rule 503. Continuing education hours required for renewal shall be as follows:

(a) A licensee who holds a license for more than 12 months, but less than 24 months from the date of initial licensure shall obtain 12 hours of continuing education for the first renewal period.

(b) A licensee who holds a license for 24 months or more from the date of initial licensure shall obtain 24 hours of continuing education for the renewal period.

R 339.15504 Determination of credit; forms; recordkeeping.

Rule 504. A licensee shall maintain records of continuing hours earned for 4 consecutive years. The records shall include both of the following:

(a) The courses or activities completed, the dates when the courses or activities were held, the sponsoring organization, and the continuing education hours earned.

(b) Verification of attendance at a course or activity, such as completion certificates or other supporting documentation.

R 339.15505 Sponsor.

Rule 505. A sponsor offering continuing education may include any of the following:

(a) National Council of Architectural Registration Boards.

(b) American Institute of Architects.

(c) Construction Specifications Institute.

(d) University of Michigan.

(e) Lawrence Technological University.

(f) University of Detroit Mercy.

(g) Andrews University.

(h) United States Green Building Council.

(i) A college or university offering a course or activity relevant to architectural education, design, or construction technology education.

(j) An organization offering a course or activity relevant to architectural education, design, or construction technology education.

R 339.15506 HSW subjects for continuing education.

Rule 506. HSW subjects may include any of the following:

(a) Building design.

(b) Environmental or land use analysis.

(c) Life safety.

(d) Architectural programming.

(e) Site planning.

(f) Site and soils analysis.

(g) Accessibility.

(h) Structural systems considerations, including lateral forces; hurricane or high wind safety and design.

(i) Building codes.

(j) Evaluation and selection of building systems, products, or materials.

(k) Construction methods.

(l) Contract documentation.

- (m) Construction administration.
- (n) Energy conservation.
- (o) Zoning and governance policies and procedures.
- (p) Sustainability.
- (q) Historic preservation.
- (r) Requirements for building in coastal areas.
- (s) Mold or other hazardous material mitigation.
- (t) The impact of design on human physiology and neurology.
- (u) Other similar HSW subjects relevant to architecture.

R 339.15507 Auditing.

Rule 507. The department may establish a process for auditing licensees regarding continuing education for compliance with the act and these rules.

ADMINISTRATIVE RULES

DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS

PUBLIC SERVICE COMMISSION

ELECTRICAL SUPPLY AND COMMUNICATION LINES AND ASSOCIATED EQUIPMENT

Filed with the Secretary of State on October 7, 2013

These rules become effective immediately upon filing with the Secretary of State unless adopted under section 33, 44, or 45a(6) of 1969 PA 306. Rules adopted under these sections become effective 7 days after filing with the Secretary of State.

(By authority conferred on the public service commission by section 7 of 1909 PA 106, sections 2 and 3 of 1913 PA 206, sections 4 and 6 of 1939 PA 3, as amended, and section 5 of 1939 PA 419, MCL 460.557, 460.102, 460.103, 460.4, 460.6, and 460.55)

R 460.813 of the Michigan Administrative Code is amended as follows:

R 460.813 Standards of good practice; adoption by reference.

Rule 3. Parts 1, 2, and 3 and sections 1, 2, 3, and 9 of the national electrical safety code, 2012 edition (ANSI-C2-2012), are adopted by reference in these rules as standards of accepted good practice. Parts 1, 2, and 3 and sections 1, 2, 3, and 9 of the national electrical safety code, 2012 edition (ANSI-C2-2012), are available from the institute of electrical and electronics engineers (ieee) at the following address: IEEE Operations Center, 445 Hoes Lane, Piscataway, NJ 08854-4141 USA, phone: (732) 981-0060, or via the internet at the following web site: http://www.techstreet.com/standards/ieee/c2_2012?product_id=1786726 at a cost of \$170.00 as of the time of adoption of this rule, plus a handling charge.

Copies of the code may also be obtained from the Michigan Public Service Commission, 6545 Mercantile Way, P.O. Box 30221, Lansing, MI 48909 at the same cost charged by the ieee as of the adoption of this rule, plus \$20 for shipping and handling.

ADMINISTRATIVE RULES

DEPARTMENT OF STATE POLICE

MICHIGAN COMMISSION ON LAW ENFORCEMENT STANDARDS

PUBLIC SAFETY OFFICERS BENEFIT PROGRAM

Filed with the Secretary of State on October 15, 2013

These rules become effective immediately upon filing with the Secretary of State unless adopted under section 33, 44, or 45a(6) of 1969 PA 306. Rules adopted under these sections become effective 7 days after filing with the Secretary of State.

(By authority conferred on the Michigan Commission on Law Enforcement Standards by section 3 of 2004 PA 46 and by section 9 of 1965 PA 380, MCL 28.633 and 16.109)

R 28.14965 is rescinded from the Code as follows:

R 28.14965 Rescinded.

ADMINISTRATIVE RULES

DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS

DIRECTOR'S OFFICE

PSYCHOLOGY - GENERAL RULES

Filed with the Secretary of State on October 3, 2013

These rules become effective 7 days after filing with the Secretary of State.

(By authority conferred on the director of the department of licensing and regulatory affairs by sections 16145 and 18201 of 1978 PA 368, MCL 333.16145 and 333.18201 and Executive Order Nos. 1996-1, 1996-2, 2003-1, and 2011-4, being MCL 330.3101, 445.2001, 445.2011 and 445.2030)

R 338.2506 of the Michigan Administrative Code is amended to read as follows:

R 338.2506 Application for licensure; education, training, and experience requirements.

Rule 6. To be granted a license under MCL 333.18223(1), an applicant shall satisfy all of the following requirements:

(a) Education: An applicant shall possess either a doctoral degree in psychology or a doctoral degree in a closely related field. Either degree shall meet both of the following requirements:

(i) The degree shall be from a regionally accredited college, university, or institution that meets the standards adopted by reference in R 338.2511(2).

(ii) The degree shall be from a designated or accredited educational program that meets the standards adopted by reference in R 338.2511(3).

(b) Training: An applicant shall have successfully completed an internship that was an integrated part of a doctoral degree that meets the requirements in subdivision (a)(i) and (ii) of this rule, or is an equivalent postdoctoral internship as determined by the board.

(c) Experience: An applicant shall have acquired postdoctoral experience in the practice of psychology that meets all of the following criteria:

(i) The experience constitutes not less than 2,000 clock hours completed in not more than 2 consecutive years.

(ii) The experience shall be accumulated at not less than 16 clock hours per week nor more than 40 clock hours per week.

(iii) In cases of hardship, the board may consider a request for an extension of the time period identified in paragraphs (i) and (ii) of this subdivision.

(iv) The applicant shall function as a psychologist using generally accepted applications of psychological knowledge and techniques acquired during the applicant's education and training.

(v) The experience is acquired in an organized health care setting, as defined in R 338.2501(1)(b), or other arrangement receiving approval of the board.

ADMINISTRATIVE RULES

DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS

DIRECTOR'S OFFICE

MICHIGAN MEDICAL MARIHUANA

Filed with the Secretary of State on October 3, 2013

These rules become effective 7 days after filing with the Secretary of State.

(By authority conferred on the director of the department of licensing and regulatory affairs by section 5 of initiated law 1 of 2008, MCL 333.26425 and Executive Reorganization Order Nos. 1996-1, 1996-2, 2003-1 and 2011-4, MCL 330.3101, MCL 445.2001, MCL 445.2011 and 445.2030)

R 333.101, R 333.103, R 333.113, R 333.117, R 333.121, R 333.125, and R 333.127 of the Michigan Administrative Code are amended as follows:

R 333.101 Definitions.

Rule 1. As used in these rules:

- (1) "Act" means the Michigan medical marihuana act, Initiated Law 1 of 2008, MCL 333.26421 to 333.26430.
- (2) "Applicant" means a qualifying patient applying for a medical marihuana registry identification card on a form provided by the department of licensing and regulatory affairs.
- (3) "Code" means 1978 PA 368, MCL 333.1101 to 333.25211.
- (4) "Conviction" or "convicted" means a criminal conviction of an offense by a guilty verdict from a judge or jury, plea of guilty, or plea of no contest.
- (5) "Debilitating medical condition" means 1 or more of the following:
 - (a) Cancer, glaucoma, positive status for human immunodeficiency virus, acquired immune deficiency syndrome, hepatitis C, amyotrophic lateral sclerosis, Crohn's disease, agitation of Alzheimer's disease, nail patella, or the treatment of these conditions.
 - (b) A chronic or debilitating disease or medical condition or its treatment that produces, for a specific patient, 1 or more of the following: cachexia or wasting syndrome; severe and chronic pain; severe nausea; seizures, including but not limited to those characteristic of epilepsy; or severe and persistent muscle spasms, including but not limited to those characteristic of multiple sclerosis.
 - (c) Any other medical condition or treatment for a medical condition approved by the department pursuant to a petition submitted under R 333.133.
- (6) "Department" means the department of licensing and regulatory affairs.
- (7) "Enclosed, locked facility" means a closet, room, or other comparable, stationary, and fully enclosed area equipped with secured locks or other functioning security devices that permit access only by a registered primary caregiver or registered qualifying patient. Marihuana plants grown outdoors are considered to be in an enclosed, locked facility if they are not visible to the unaided eye from an adjacent property when viewed by an individual at ground level or from a permanent structure and are grown within a stationary structure that is enclosed on all sides, except for the base, by chain-link fencing, wooden slats, or a similar material that prevents

access by the general public and that is anchored, attached, or affixed to the ground; located on land that is owned, leased, or rented by either the registered qualifying patient or a person designated through the departmental registration process as the primary caregiver for the registered qualifying patient or patients for whom the marihuana plants are grown; and equipped with functioning locks or other security devices that restrict access to only the registered qualifying patient or the registered primary caregiver who owns, leases, or rents the property on which the structure is located. Enclosed, locked facility includes a motor vehicle if both of the following conditions are met:

(a) The vehicle is being used temporarily to transport living marihuana plants from 1 location to another with the intent to permanently retain those plants at the second location.

(b) An individual is not inside the vehicle unless he or she is either the registered qualifying patient to whom the living marihuana plants belong or the individual designated through the departmental registration process as the primary caregiver for the registered qualifying patient.

(8) "Marihuana" means that term as defined in section 7106 of the code.

(9) "Medicaid health plan" means the medical assistance program managed by the department.

(10) "Medical use" means the acquisition, possession, cultivation, manufacture, use, internal possession, delivery, transfer, or transportation of marihuana or paraphernalia relating to the administration of marihuana to treat or alleviate a registered qualifying patient's debilitating medical condition or symptoms associated with the debilitating medical condition.

(11) "Paraphernalia" means any item defined as "drug paraphernalia" pursuant to section 7451 of the code.

(12) "Parent or legal guardian" means the custodial parent or legal guardian with responsibility for health care decisions for a qualifying patient who is under 18 years of age.

(13) "Petition" means a written request for the department to add new medical conditions or treatments to the list of debilitating medical conditions under R 333.101(5).

(14) "Physician" means an individual licensed as a physician under part 170 or 175 of the code. For purposes of the act, neither a physician assistant nor a nurse practitioner is authorized to sign the statement attesting to the patient's debilitating medical condition.

(15) "Primary caregiver" or "caregiver" means a person who is at least 21 years old and who has agreed to assist with a patient's medical use of marihuana and who has not been convicted of any felony within the past 10 years and has never been convicted of a felony involving illegal drugs or a felony that is an assaultive crime as defined in section 9a of chapter X of the code of criminal procedure, 1927 PA 175, MCL 770.9a.

(16) "Public place" means a place open to the public.

(17) "Qualifying patient" or "patient" means a person who has been diagnosed by a physician as having a debilitating medical condition.

(18) "Registry identification card" means a document issued by the department that identifies a person as a registered qualifying patient or registered primary caregiver.

(19) "Supplemental Security Income" means the monthly benefit assistance program administered by the federal government for persons who are age 65 or older, or blind, or disabled and who have limited income and financial resources.

(20) "Usable marihuana" means the dried leaves and flowers of the marihuana plant, and any mixture or preparation thereof, but does not include the seeds, stalks, and roots of the plant.

(21) "Visiting qualifying patient" means a patient who is not a resident of this state or who has been a resident of this state for less than 30 days.

(22) "Written certification" means a document signed by a physician stating all of the following:

(a) The patient's debilitating medical condition.

(b) The physician has completed a full assessment of the patient's medical history and current medical condition, including a relevant, in-person, medical evaluation.

(c) In the physician's professional opinion, the patient is likely to receive therapeutic or palliative benefit from the medical use of marihuana to treat or alleviate the patient's debilitating medical condition or symptoms associated with the debilitating medical condition.

(23) Terms defined in the act have the same meanings when used in these rules.

R 333.103 New registration application; qualifying patient and primary caregiver.

Rule 3. A qualifying patient applying for a registry identification card shall comply with all of the following:

(a) Submit a completed application on a form provided by the department, together with the requisite fee. The completed application shall include all of the following:

(i) Name, address, and date of birth of the qualifying patient. The address for the qualifying patient shall be a physical address located in this state. A qualifying patient who is homeless shall not be required to provide a physical address.

(ii) Name, address, and telephone number of the qualifying patient's physician.

(iii) The name, address, and date of birth of the patient's primary caregiver, if applicable. A qualifying patient may designate 1 primary caregiver to assist with his or her medical use of marihuana.

(iv) A designation of whether the qualifying patient or the patient's primary caregiver, if applicable, will be allowed to possess marihuana plants for the qualifying patient's medical use.

(v) An attestation by the primary caregiver named on the application that he or she agrees to serve as the patient's primary caregiver.

(vi) A primary caregiver shall authorize the department to use the information provided on the application to secure his or her criminal conviction history to determine if he or she has been convicted of any of the following:

(A) Any felony within the past 10 years.

(B) A felony involving illegal drugs

(C) A felony that is an assaultive crime as defined in section 9a of chapter X of the code of criminal procedure, 1927 PA 175, MCL 770.9a.

(b) Submit proof of Michigan residency. For the purposes of this subdivision, an applicant shall be considered to have proved legal residency in this state if he or she provides the department with either of the following:

(i) A copy of a valid, lawfully obtained Michigan driver license issued under the Michigan vehicle code, 1949 PA 300, MCL 257.1 to 257.923, or an official state personal identification card issued under 1972 PA 222, MCL 28.291 to 28.300.

(ii) A copy of a valid Michigan voter registration.

(c) Submit photographic identification of both the qualifying patient and the patient's primary caregiver, if applicable. If the qualifying patient is under the age of 18 and does not have photographic identification, no photographic identification is required. Photocopies of the following shall be considered acceptable forms of identification:

(i) Current driver's license or identification card, with photo, issued by a state.

(ii) Identification card with photo issued by a federal, state, or government agency.

(iii) Current military identification card.

(iv) Current passport.

(v) Current student identification card with photo.

(vi) Native American tribal identification with photo

(vii) Permanent resident card or alien registration receipt card.

(d) Submit a written certification, as defined in R 333.101(22), signed by a licensed physician. If the qualifying patient is under the age of 18, written certifications from 2 physicians are required.

- (e) If the qualifying patient is under the age of 18, submit a declaration of person responsible form.

R 333.113 Registration approval; denial.

Rule 13. (1) Pursuant to section 6(c) of the act, the department shall approve or deny an application within 15 business days of receiving a completed application and the requisite fee.

(2) If an application is approved, within 5 business days of approving the application, the department shall issue a registry identification card to the registered qualifying patient and the registered primary caregiver, if applicable. The registry identification card shall include all of the following:

- (a) The name, address, and date of birth of the registered qualifying patient.
- (b) If the registered qualifying patient has designated a primary caregiver, the name, address, and date of birth of the registered primary caregiver.
- (c) The issue date and expiration date of the registry identification card.
- (d) A random identification number.
- (e) A clear designation showing whether the registered primary caregiver or the registered qualifying patient will be authorized to possess marihuana plants for the registered qualifying patient's medical use. The designation shall be determined based solely on the registered qualifying patient's preference.

(3) When a registered qualifying patient has designated a primary caregiver, the department shall issue a registry identification card to the registered primary caregiver. The registered primary caregiver's registry identification card shall contain the information specified in subrule (2) of this rule.

(4) The department shall deny an application for any of the following:

- (a) The applicant did not provide the physician's written certification.
- (b) The department determines that any information provided by the applicant was falsified.
- (c) An applicant fails to provide a physical address located in this state. This subdivision shall not apply if the applicant is homeless.
- (d) The applicant failed to meet the requirements of R 333.107.

(5) If the department denies an application, the department shall mail the applicant a denial letter within 15 business days of receipt of the completed application. The denial letter shall be sent by certified mail to the address listed on the application form and shall state the reasons for denial and when the applicant may reapply.

(6) Denial of a registry identification card shall be considered a final department action, subject to judicial review.

R 333.117 Biennial renewal; expiration of registry identification card; fee.

Rule 17. (1) Pursuant to section 6 (e) of the act, MCL 333.26426(e), a registry identification card shall be renewed on a biennial basis to maintain active status as a registered qualifying patient or a registered primary caregiver.

(2) A registry identification card shall expire on the first day of the month 2 years following issuance of the card.

(3) An applicant for renewal of a registry identification card shall submit an application and information as provided in R 333.103.

(4) If an applicant fails to comply with subrules (1) and (3) of this rule by the expiration date on the registry identification card, the registry identification card shall be considered null and void and of no further effect. The applicant may submit a new application to the department.

(5) The department shall verify the renewal application information in the same manner as specified in R 333.109.

R 333.121 Confidentiality.

Rule 21. (1) Except as provided in subrules (2) and (3) of this rule, Michigan medical marihuana program information shall be confidential and not subject to disclosure in any form or manner. Program information includes, but is not limited to, all of the following:

- (a) Applications and supporting information submitted by qualifying patients.
- (b) Information related to a qualifying patient's primary caregiver.
- (c) Names and other identifying information of registry identification cardholders.
- (d) Names and other identifying information of pending applicants and their primary caregivers.

(2) Names and other identifying information made confidential under subrule (1) of this rule may only be accessed or released to authorized employees or contractors of the department as necessary to perform official duties of the department pursuant to the act, including the production of any reports of non-identifying aggregate data or statistics.

(3) The department shall verify upon a request by law enforcement personnel whether a registry identification card is valid, without disclosing more information than is reasonably necessary to verify the authenticity of the registry identification card.

(4) The department may release information to other persons only upon receipt of a properly executed release of information signed by all individuals with legal authority to waive confidentiality regarding that information, whether a registered qualifying patient, a qualifying patient's parent or legal guardian, or a qualifying patient's registered primary caregiver. The release of information shall specify what information the department is authorized to release and to whom.

(5) Violation of these confidentiality rules may subject an individual to the penalties provided for under section 6(h)(4) of the act.

R 333.125 Revocation; nullification.

Rule 25. (1) A registered qualifying patient or registered primary caregiver who has been convicted of selling marihuana to someone who is not allowed to use marihuana for medical purposes under the act, shall have his or her registry identification card revoked and may be found guilty of a felony punishable by imprisonment for not more than 2 years or a fine of not more than \$2,000.00, or both, in addition to any other penalties for the distribution of marihuana.

(2) A registry identification card that is later determined to be based on fraudulent information is null and void and of no effect.

(3) Any person who has been convicted of any felony within the past 10 years, a felony involving illegal drugs, or a felony that is an assaultive crime as defined in section 9a of chapter X of the code of criminal procedure, 1927 PA 175, MCL 770.9a shall not serve as a qualifying patient's primary caregiver under the act.

(4) The department shall send written notice by certified mail to a registered qualifying patient or the patient's registered primary caregiver of either of the following:

- (a) An intent to revoke or nullify a registry identification card.
- (b) That a primary caregiver no longer qualifies for approval under the act based on the caregiver's conviction of a felony specified in subrule (3) of this rule.

(5) The notice referenced in subrule (4) of this rule shall include the right to request a contested case hearing. If the request for hearing is not filed with the department within 21 days from the date the notice was mailed by the department, the right to request a contested case hearing shall be waived.

R 333.127 Management of medical marihuana.

Rule 27. (1) A qualifying patient who has been issued and possesses a registry identification card shall not be subject to arrest, prosecution, or penalty in any manner, or denied any right or privilege, including but not limited to civil penalty or disciplinary action by a business or occupational or professional licensing board or bureau, for the medical use of marihuana in accordance with the act, if the qualifying patient possesses an amount of marihuana that does not exceed the following:

(a) Two and one-half (2.5) ounces of usable marihuana.

(b) If the qualifying patient has not specified that a primary caregiver will be allowed under state law to cultivate marihuana for the qualifying patient, 12 marihuana plants kept in an enclosed, locked facility.

(c) Any incidental amount of seeds, stalks, and unusable roots.

(2) A primary caregiver who has been issued and possesses a registry identification card shall not be subject to arrest, prosecution, or penalty in any manner, or denied any right or privilege, including but not limited to civil penalty or disciplinary action by a business or occupational or professional licensing board or bureau, for assisting a qualifying patient to whom he or she is connected through the department's registration process with the medical use of marihuana in accordance with the act, if the primary caregiver possesses an amount of marihuana that does not exceed the following:

(a) Two and one-half (2.5) ounces of usable marihuana for each registered qualifying patient to whom he or she is connected through the department's registration process.

(b) For each registered qualifying patient who has specified that the primary caregiver will be allowed under state law to cultivate marihuana for the qualifying patient, 12 marihuana plants kept in an enclosed, locked facility.

(c) Any incidental amount of seeds, stalks, and unusable roots.

(3) An individual may simultaneously be registered as a qualifying patient and as a primary caregiver.

(4) The privilege from arrest under subrule (1) of this rule applies only if the qualifying patient presents both his or her registry identification card and a valid driver license or government-issued identification card that bears a photographic image of the qualifying patient.

(5) The privilege from arrest under subrule (2) of this rule applies only if the primary caregiver presents both his or her registry identification card and a valid driver license or government-issued identification card that bears a photographic image of the primary caregiver.

**PROPOSED ADMINISTRATIVE RULES,
NOTICES OF PUBLIC HEARINGS**

MCL 24.242(3) states in part:

“... the agency shall submit a copy of the notice of public hearing to the Office of Regulatory Reform for publication in the Michigan register. An agency's notice shall be published in the Michigan register before the public hearing and the agency shall file a copy of the notice of public hearing with the Office of Regulatory Reform.”

MCL 24.208 states in part:

“Sec. 8. (1) The Office of Regulatory Reform shall publish the Michigan register at least once each month. The Michigan register shall contain all of the following:

* * *

(d) Proposed administrative rules.

(e) Notices of public hearings on proposed administrative rules.”

PROPOSED ADMINISTRATIVE RULES

DEPARTMENT OF **LICENSING AND REGULATORY AFFAIRS** ~~LABOR & ECONOMIC GROWTH~~

DIRECTOR'S OFFICE

OCCUPATIONAL HEALTH STANDARDS

Proposed Draft October 7, 2013

These rules become effective immediately upon filing with the Secretary of State unless adopted under section 33, 44, or 45a(6) of 1969 PA 306. Rules adopted under these sections become effective 7 days after filing with the Secretary of State.

(By authority conferred on the director of the department of **licensing and regulatory affairs** ~~labor and economic growth~~ by sections 14 and 24 of 1974 PA 154, **MCL 408.1014 and 408.1024; and Executive Reorganization Order Nos. 1996-1, 1996-2, 2003-1, 2008-4, and 2011-4, MCL 330.3101, 445.2001, 445.2011, 445.2025 and 445.2030.**) ~~and Executive Reorganization Order Nos. 1996-1, 1996-2, AND 2003-18, MCL 408.1014, 408.1024, 330.3101, 445.2001, AND 445.2011)~~

R 325.60051 and R 325.60052 of the Michigan Administrative Code are amended as follows:

PART 451. RESPIRATORY PROTECTION

R 325.60051 Scope and application.

Rule 1. ~~(4)~~ In the control of occupational diseases caused by breathing air contaminated with harmful dusts, fog, fumes, mists, gases, smokes, spray, or vapors, the primary objective shall be to prevent atmospheric contamination. The prevention of atmospheric contamination shall be accomplished, as far as feasible, by accepted engineering control measures. When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators shall be used pursuant to these rules. ~~(2) These rules replace occupational health rule 3502(1) to (7).~~

R 325.60052 Adoption by reference of federal standard.

Rule 2. (1) The federal occupational safety and health administration's regulations on respiratory protection promulgated by the United States department of labor and codified at 29 C.F.R. §1910.134, "Respiratory protection," **as amended on June 8, 2011, and effective November 22, 2006**, are adopted by reference in these rules. ~~as of the effective date of these rules. The federal rule was first promulgated on January 8, 1998, and changes appeared in the Federal Register on pp. 20098 to 20099, April 23, 1998 and on pp. 46993, August 4, 2004. The final rule appeared in the Federal Register on pp. 50187 to 50188, August 24, 2006.~~

(2) The adopted federal regulations shall have the same force and effect as a rule promulgated under 1974 PA 154, MCL 408.1001 to 408.1094.

(3) **The OSHA regulations adopted by reference in subrule (1) of these rules are available from the United States Department of Labor, Occupational Safety and Health Administration, via the**

internet at website www.osha.gov, at no charge as of the time of adoption of these rules. ~~The adopted federal regulations are available without cost as of the time of adoption of these rules from the United States Department of Labor, OSHA, 315 West Allegan, Room 315, Lansing, Michigan 48933 or via the internet at website: www.osha.gov, or from the Michigan Department of Labor and Economic Growth, MIOSHA Standards Section, P.O. Box 30643, Lansing, Michigan 48909-8143 or via the internet at website: www.michigan.gov/mioshastandards. For quantities greater than 5, the cost, as of the time of adoption of these rules, is 4 cents per page.~~

(4) The standards adopted in subrule (1) of this rule are also available for inspection at the Department of Licensing and Regulatory Affairs, MIOSHA Standards Section, 7150 Harris Drive, P.O. Box 30643, Lansing, Michigan, 48909-8143.

(5) Copies of the standards adopted in subrule (1) of this rule may be obtained from the publisher or may also be obtained from the Department of Licensing and Regulatory Affairs, MIOSHA Standards Section, 7150 Harris Drive, P.O. Box 30643, Lansing, Michigan, 48909-8143, at the cost charged in this rule, plus \$20.00 for shipping and handling.

PROPOSED ADMINISTRATIVE RULES

DEPARTMENT OF ENVIRONMENTAL QUALITY
REMEDATION AND REDEVELOPMENT DIVISION
ENVIRONMENTAL CONTAMINATION RESPONSE ACTIVITY

Proposed Draft October 25, 2013

Filed with the Secretary of State on

These rules become effective immediately upon filing with the Secretary of State unless adopted under section 33, 44, or 45a(6) of the 1969 PA 306. Rules adopted under these sections become effective 7 days after filing with the Secretary of State.

(By authority conferred on the director of the Department of Environmental Quality by sections 20104(1) and 20120a(18) of 1994 PA 451, MCL 324.20104(1) and 324.20120a(18).

R 299.1, R 299.2, R 299.3, R 299.4, R 299.6, R 299.8, R 299.9, R 299.10, R 299.14, R 299.18, R 299.22, R 299.24, R 299.26, R 299.28, R 299.30, R 299.34, R 299.36, R 299.38, R 299.40, R 299.44, R 299.46, R 299.48, R 299.49 and R 299.50 are added to the Michigan Administrative Code to read as follows:

CLEANUP CRITERIA REQUIREMENTS FOR RESPONSE ACTIVITY

R 299.1 Definitions; A to I.

Rule 1. As used in this part:

(a) "Act" means 1994 PA 451, MCL 324.101 to 324.90106, known as the Natural Resources and Environmental Protection Act.

(b) "Acute toxicity" means the ability of a hazardous substance to cause a debilitating or injurious effect in an organism as a result of a single or short-term exposure.

(c) "Ambient air" means the atmosphere outside of buildings.

(d) "Applicable criterion" means a cleanup criterion for a relevant pathway. A criterion is not an applicable criterion if the exposure pathway is not a relevant pathway at the facility or if the exposure it addresses is reliably restricted by a restrictive covenant or institutional control or other mechanism allowed for under part 201 of the act and these rules.

(e) "Aquifer" means a geological formation, group of formations, or part of a formation capable of yielding a significant amount of groundwater to wells or springs.

(f) "Best available information" means, when used in relation to a risk assessment or the development of cleanup criteria, the most scientifically credible and relevant data available about a particular hazardous substance. Such information may include, but is not limited to, any of the following:

(i) The peer reviewed scientific literature.

(ii) Information sources recognized by the risk assessment community, such as the integrated risk information system database maintained by the United States environmental protection agency or other scientifically reliable databases.

(iii) Other scientific studies that are acceptable to the department.

(g) "Cancer slope factor" means a plausible upper-bound estimate of the probability of a response per unit dose of a hazardous substance over a lifetime. The cancer slope factor is used to estimate an upper bound probability of an individual developing cancer as a result of a lifetime exposure to a particular level of a potential carcinogen.

(h) "Carcinogen" means a hazardous substance which, based on the weight of evidence, causes an increased incidence of benign or malignant neoplasms in animals or humans or that substantially decreases the time in which neoplasms develop in animals or humans.

(i) "Chronic toxicity" means the ability of a hazardous substance to cause an injurious or debilitating effect in an organism that results from repeated exposure to the hazardous substance for a time period representing a substantial portion of the natural life expectancy of the organism.

(j) " C_{sat} " means the concentration in soil at which the solubility limits of the soil pore water, the vapor phase limits of the soil pore air, and the absorptive limits of the soil particles have been reached. As used in these rules, C_{sat} is a theoretical threshold above which a free-phase liquid (non-aqueous phase liquid) hazardous substance may exist.

(k) "Direct contact" means exposure to hazardous substances through ingestion or dermal contact.

(l) "Generic residential" means the cleanup criteria established by the department under section 20120a(1)(a) of the act and these rules.

(m) "Groundwater" means water below the land surface in a zone of saturation.

(n) "Increased cancer risk of 1 in 100,000" means the 95% upper bound on the calculated risk of 1 additional cancer above the background cancer rate per 100,000 individuals continuously exposed to a carcinogen at a given average daily dose for a 70-year lifetime.

(o) "Inhalation unit risk factor" means the additional lifetime cancer risk occurring in a population in which all individuals are exposed continuously for life to a concentration of 1 microgram per cubic meter of the hazardous substance in the air they breathe. The inhalation unit risk factor shall be calculated under the provisions of part 55 of the act and the rules promulgated under that part.

(p) "Initial threshold screening level" means a concentration in air of a toxic air contaminant which is used to evaluate noncarcinogenic health effects and is calculated under part 55 of the act and the rules promulgated under that part.

(q) "Institutional control" means a measure which is approved by the department, which takes a form other than a restrictive covenant, and which limits or prohibits certain activities that may interfere with the integrity or effectiveness of a remedial action or result in exposure to hazardous substances at a facility, or which provides notice about the presence of a hazardous substance at a facility in concentrations that exceed only an aesthetic-based cleanup criterion.

(r) "Ionizing organic hazardous substance" means an organic hazardous substance that has functional chemical groups that become ions when exposed to varying pH conditions.

R 299.2 Definitions; L to V.

Rule 2. As used in this part:

(s) "Land or resource use restrictions" means the provisions of any of the following measures that are used to limit or prohibit activities that may interfere with the integrity or effectiveness of a response activity, or to limit or prohibit activities that may result in exposure to hazardous substances at a facility, or to provide notice about the presence of a hazardous substance at a facility in concentrations that exceed only an aesthetic-based cleanup criterion:

(i) A restrictive covenant.

(ii) A notice of approved environmental remediation.

(iii) An institutional control, which may be a local ordinance or any form of preapproved institutional control, such as a notice of aesthetic impact.

(t) "Leachate" means liquid, including any suspended components in the liquid, that has percolated through or drained from a hazardous substance or soil contaminated with a hazardous substance.

(u) "Linearized multistage model" means a dose-response model which assumes that there are a number of distinct biological stages or changes that must occur for a normal cell to be transformed into a tumor and which assumes the dose-response relationship to be linear at low doses.

(v) "Notice of aesthetic impact" means a document that describes conditions at a facility that result from the presence of hazardous substances at concentrations which exceed only cleanup criteria that are based on aesthetic impacts.

(w) "Reference dose" or "RfD" means a conservative estimate of the daily intake of the human population, including sensitive subgroups, that is likely to be without appreciable risk of deleterious effect during a lifetime. The reference dose is expressed in units of milligrams per kilogram body weight per day.

(x) "Relevant pathway" means an exposure pathway that is reasonable and relevant because there is a reasonable potential for exposure to a hazardous substance to occur to a human or nonhuman receptor. The components of an exposure pathway are a source or release of a hazardous substance, an exposure point, and, if the exposure point is not the source or point of release, a transport medium. The existence of a municipal water supply, exposure barrier, or other similar feature does not automatically make an exposure pathway irrelevant.

(y) "Relative source contribution factor" or "RSC" means that portion of a person's total daily intake of a noncarcinogenic hazardous substance that comes from the medium being addressed by the cleanup criterion.

(z) "Risk assessment" means the analytical process used to determine the risk to the public health, safety, or welfare or to the environment associated with a release or threat of release of a hazardous substance at a facility.

(aa) "Secondary maximum contaminant level" means the United States environmental protection agency's secondary maximum contaminant level for protection of the public welfare for substances that may adversely affect the taste, odor, color, appearance, or any aesthetic quality of drinking water, as set forth in 40 C.F.R. part 143 (revised as of July 1, 2012), which is adopted by reference in these rules and which is available for inspection at the Lansing office of the department, 525 West Allegan Street, Lansing, Michigan. Copies of the provisions may be purchased, at a cost as of the time of adoption of these rules of \$55.00, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401 (Stock Number 869-044-00152-7), or from the Department of Environmental Quality, Remediation and Redevelopment Division, 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(bb) "Toxicological interaction" means simultaneous exposure to 2 or more hazardous substances which will produce a toxicological response that is greater or less than their individual responses.

(cc) "Weight of evidence," a term of art used in risk assessment, means an evaluation of the relevant scientific data conducted to determine the likelihood that a hazardous substance is a human carcinogen or causes noncancer adverse health effects, or both. The evaluation may include any of the following information in addition to toxicological bioassays:

(i) Structure-activity relationships.

(ii) chemical-physical properties.

(iii) Short-term test findings.

(iv) Results of appropriate physiological, biological, and toxicological observations.

(v) Comparative metabolism and pharmacokinetic studies.

(dd) "Volatile" means any compound that exhibits a Henry's law constant equal to or greater than 0.00001 atmosphere-cubic meter per mole at standard temperature and pressure.

R 299.3 Response activities; protection of public health, safety, welfare, and environment required; rules applicable to interim response actions designed to meet cleanup criteria; degree of cleanup; modification of cleanup category; aquifers; unacceptability of response activity plan.

Rule 3. (1) All response activities shall be protective of the public health, safety, and welfare and the environment. Applicable generic cleanup criteria established by the department pursuant to section 20120a(1) and site specific cleanup criteria approved by the department under section 20120a(2) and 20120b of the act and these rules reflect the department's judgment, at the time the criteria are established or approved by the department, about the numerical criteria required to meet this protectiveness requirement, subject to the provisions of R 299.4(3), R 299.28, and R 299.34(2).

(2) The rules in this part apply to interim response activities that are designed to meet cleanup criteria. References in this part to response activity also include those interim response activities.

(3) The category of land use-based remedial action under section 20120a(1) of the act or the site-specific cleanup criteria identified under sections 20120a(2) and 20120b of the act may be modified by the person proposing to conduct the response activity that will result in modification during implementation or after completion of a remedial action, if appropriate to the facility and if that modification is accomplished in a manner that is consistent with the act and these rules.

(4) If a revised land use-based remedial action includes characteristics that are required to be approved by the department, then the person implementing the change shall seek department approval as required by part 201 of the act and these rules.

(5) The horizontal and vertical extent of hazardous substance concentrations in an aquifer above the higher of either the concentration allowed by section 20120a(1)(a) or (10) of the act, as applicable, shall not increase after the initiation of remedial actions to address an aquifer, except as approved by the director as provided in section 20118(5) and (6) of the act.

(6) All remedial actions that address the remediation of an aquifer shall provide for removal of the hazardous substance or substances from the aquifer, either through active remediation or as a result of naturally occurring biological or chemical processes which can be documented to occur at the facility, except as provided in section 20118(5) and (6) of the act.

R 299.4 General requirements for application of cleanup criteria.

Rule 4. (1) All cleanup criteria used in response activity undertaken under part 201 of the act and these rules shall be based on best available information.

(2) The generic cleanup criteria developed by the department using the algorithms presented in these rules are derived primarily from data that reflect chronic toxicity endpoints. If a hazardous substance has a more sensitive toxic effect than those associated with the chronic toxicity data used to calculate a generic criterion, then a criterion shall be developed to address the most sensitive effect. The generic cleanup criteria established by the department shall be accepted as protective of the most sensitive toxic effect in a given exposure pathway for the hazardous substance in question.

(3) If the department has not calculated a criterion for a hazardous substance for a given exposure pathway, then the person proposing or implementing the response activity shall supply the necessary data for the department to calculate a criterion or establish a criterion under subrule (4) of this rule, unless the department determines that a numerical criterion is not required to assure that a given response activity will be protective.

(4) A generic or site-specific cleanup criterion may be established by the department based on best professional judgment instead of a calculation based on minimum toxicity data for a specific hazardous substance when the minimum toxicity data are not available for that hazardous substance, but data of sufficient quality are available to show that the hazardous substance in question can be adequately assessed by comparison to the toxicity of another hazardous substance for which sufficient data are

available. A criterion may be established by the department in this manner when the hazardous substances are expected by the department to have similar fate and toxicity.

R 299.6 Generic cleanup criteria; toxicological and chemical-physical properties; use of generic cleanup criteria as risk based screening levels; procedure for developing additional generic criteria.

Rule 6. (1) Except as provided in subrules (9), (10) and (11) of this rule, generic groundwater cleanup criteria for the residential and nonresidential categories shall be the values shown in table 1 of R 299.44. If a generic groundwater cleanup criterion is higher than the flammability and explosivity screening level shown in table 1 of R 299.44, then the person proposing or implementing response activity shall document whether additional response activity is required to protect against the acute hazard.

(2) Except as provided in subrules (9), (10), and (11) of this rule, generic soil cleanup criteria for the residential category shall be the values shown in table 2 of R 299.46. If soil concentrations are greater than C_{sat} , then the person proposing or implementing response activity shall evaluate whether additional response activity is required to control free-phase liquids or to protect against risks associated with free-phase liquids that are not accounted for in development of the generic criteria.

(3) Except as provided in subrules (9), (10), and (11) of this rule, generic soil cleanup criteria for the nonresidential category shall be the values shown in table 3 of R 299.48.

(4) The generic cleanup criteria shown in R 299.44, R 299.46, and R 299.48 and identified under subrule (12) of this rule may be used and known as risk-based screening levels for corrective actions required under part 213 of the act.

(5) Generic cleanup criteria under R 299.44, R 299.46, and R 299.48 are based on the target detection limit or background concentration in the following cases:

(a) If a calculated cleanup criterion is less than the target detection limit for that hazardous substance in a given medium, then the target detection limit is the cleanup criterion. Criteria to which this subdivision applies are designated with a footnote in the criteria tables.

(b) A background concentration may be substituted for a generic cleanup criterion when the background concentration is higher than a criterion shown in R 299.44, R 299.46, or R 299.48.

(6) If a hazardous substance imparts adverse aesthetic characteristics to groundwater at a concentration less than the health-based criterion for that hazardous substance, then the aesthetic-based criterion derived under R 299.9 is shown as the drinking water criterion in the table of generic cleanup criteria in R 299.44 and designated with a footnote.

(7) Except as provided in section 20120a(9) of the act, R 299.49(1)(l), and R 299.49(1)(o), the toxicological and physical-chemical input values used by the department to derive generic cleanup criteria with the equations and default assumptions provided in R 299.10, R 299.14, R 299.20, R 299.22, R 299.24, and R 299.26 are shown in table 4 of R 299.50.

(8) Toxicological and chemical-physical data in table 4 of R 299.50, if available, shall be used in conjunction with the equations and default assumptions that appear in these rules for the development of generic cleanup criteria under subrules (9) or (10) of this rule, except as provided in section 20120a(9) of the act, R 299.49(1)(l), and R 299.49(1)(o).

(9) For a substance that is not listed in the cleanup criteria tables in R 299.44, R 299.46, or R 299.48, the department may determine if the substance is a hazardous substance using best available information about the toxicological and physical-chemical properties of that substance and use that information to develop a generic or site-specific cleanup criterion.

(10) For a substance that is listed in the cleanup criteria tables in R 299.44, R 299.46, or R 299.48, if the department obtains sufficient information to support calculation of a cleanup criterion which is designated in the cleanup criteria tables or table 4 of R 299.50 with a footnote “ID” or “NA,” the department shall use best available information to calculate a cleanup criterion for the hazardous substance.

(11) If a new state drinking water standard is established or a state drinking water standard is changed after the effective date of this rule, the drinking water standard in effect under section 5 of 1976 PA 399, MCL 325.1005, shall become the generic residential cleanup criterion under R 299.44, as provided in section 20120a(5) of the act.

(12) If a generic cleanup criterion is developed under subrule (9) or (10) of this rule, or modified under subrule (11) of this rule, the department shall make the new toxicological and physical-chemical data and criterion available by announcing it on the department's internet web site, and by publishing notice of the change in the department calendar, or by such other means that effectively notifies interested persons. The new criterion shall take effect when published and announced by the department as required in this rule. The new data and resulting cleanup criterion shall remain effective and be used as required under these rules until the department promulgates revised data and criteria pursuant to administrative procedures act, 1969 PA 306, MCL 24.201 to 24.328.

R 299.8 Groundwater cleanup criteria generally.

Rule 8. (1) Except as provided in subrule (2) of this rule, the generic groundwater cleanup criteria applicable at a given facility shall be the most restrictive of the criteria developed under R 299.9, R 299.10, or R 299.14, considering those pathways that are reasonable and relevant to the facility and the category of cleanup criteria being proposed or implemented.

(2) If a generic groundwater cleanup criterion developed under R 299.9, R 299.10, or R 299.14 is greater than the solubility limit of that hazardous substance in water at 25° Celsius, then the solubility limit shall be the generic criteria for that pathway.

R 299.9 Calculation of generic cleanup criteria for groundwater in aquifer based on adverse aesthetic impacts.

Rule 9. (1) If a hazardous substance, singly or in combination with other hazardous substances present at the facility, imparts adverse aesthetic characteristics to groundwater in an aquifer, then the cleanup criterion shall be the secondary maximum contaminant level, or, if there is no secondary maximum contaminant level, then the concentration that is documented as the taste or odor threshold concentration or the concentration below which appearance or other aesthetic characteristics are not adversely affected. The criteria of this subrule shall apply only when the level required by this subrule is less than the level required by section 20120a(4) of the act. A taste or odor threshold concentration or a concentration adversely affecting appearance shall be determined according to methods approved by the United States environmental protection agency.

(2) For the purposes of this rule, the point of exposure shall be presumed to be any point in the affected aquifer.

R 299.10 Generic cleanup criteria for groundwater in aquifer based on ingestion of groundwater for drinking water.

Rule 10. (1) Exposure to groundwater by ingestion shall be considered a relevant pathway for groundwater that satisfies either of the following conditions:

(a) The groundwater is in an aquifer.

(b) The groundwater is not in an aquifer, but can reasonably be expected to transport a hazardous substance into an aquifer in a concentration that exceeds the generic residential criteria developed under subrule (2) of this rule.

(2) The criteria developed pursuant to R 299.9 and R 299.10 are not applicable if ingestion of the groundwater is, or as part of the response activity will be, reliably restricted by a restrictive covenant, a notice of approved environmental remediation, or an institutional control that is allowed for under these rules and approved by the department, if approval is required.

(3) Cleanup criteria for groundwater based on ingestion of groundwater for drinking water shall be calculated according to the following algorithms, except as provided for in R 299.34. Criteria calculated under this subrule shall be the generic cleanup criterion, unless a state drinking water standard is available or, if a criterion protective of adverse aesthetic characteristics is more restrictive, as provided for in section 20120a(5) of the act.

EQUATION FOR CARCINOGENIC EFFECTS:

$$DWC = \frac{TR \times BW \times AT \times CF}{SF \times EF \times ED \times IR_{dw}}$$

where,

DWC	(Drinking water criterion)	=	chemical-specific (ug/L or ppb)
TR	(Target risk level)	=	10^{-5}
BW	(Body weight)	=	70 kg
AT	(Averaging time in days)	=	25,550 days (70 years x 365 days/year)
CF	(Conversion factor)	=	1000 ug/mg
SF	(Oral cancer slope factor)	=	chemical-specific (mg/kg-day) ⁻¹
EF	(Exposure frequency)	=	350 days/year (residential) 245 days/year (nonresidential)
ED	(Exposure duration)	=	30 years (residential) 21 years (nonresidential)
IR _{dw}	(Drinking water ingestion rate)	=	2 liters/day (residential) 1 liter/day (nonresidential)

EQUATION FOR NONCARCINOGENS:

$$DWC = \frac{THQ \times RfD \times BW \times AT \times RSC \times CF}{EF \times ED \times IR_{dw}}$$

where,

DWC	(Drinking water criterion)	=	chemical-specific (ug/L or ppb)
THQ	(Target hazard quotient)	=	1
RfD	(Oral reference dose)	=	chemical-specific (mg/kg-day)
BW	(Body weight)	=	70 kg
AT	(Averaging time)	=	10,950 days (30 years x 365 days/year - residential) 7,665 days (21 years x 365 days/year - nonresidential)
RSC	(Relative source contribution)	=	chemical-specific or 0.2 if chemical-specific data are not available
CF	(Conversion factor)	=	1000 ug/mg
EF	(Exposure frequency)	=	350 days/year (residential) 245 days/year (nonresidential)
ED	(Exposure duration)	=	30 years (residential) 21 years (nonresidential)
IR _{dw}	(Drinking water ingestion rate)	=	2 liters/day (residential) 1 liter/day (nonresidential)

(4) For the purposes of this rule, the point of exposure shall be presumed to be any point in the affected aquifer.

R 299.14 Generic cleanup criteria for groundwater based on hazardous substance vapors emanating from groundwater to indoor air.

Rule 14. (1) Inhalation of hazardous substance vapors volatilizing from groundwater to indoor air shall be considered a reasonable and relevant exposure pathway for hazardous substances in groundwater that have a Henry's law constant greater than or equal to 0.00001 atm-m³/mole.

(2) Except as provided in subrule (1) of this rule, if any of the following conditions exist, the generic criteria developed pursuant to this rule shall not apply and a site-specific evaluation of indoor inhalation risks shall be conducted:

(a) There is a structure present or planned to be constructed at the facility which does not have a concrete block or poured concrete floor and walls.

(b) The highest water table elevation of a contaminated saturated zone at the facility, considering seasonal variation, is within 3 meters of the ground surface.

(c) There is a sump present that is not completely isolated from the surrounding soil by its materials of construction, or there is other direct entry of contaminated groundwater into the basement.

(3) Groundwater cleanup criteria based on inhalation of hazardous substance vapors volatilizing from groundwater to indoor air shall be called groundwater volatilization indoor air inhalation criteria ("GVIIC"). The GVIIC is determined by the following series of calculations, except as provided in R 299.34(3):

EQUATION FOR CARCINOGENIC EFFECTS:

$$\text{GVIIC} = \frac{\text{TR} \times \text{AT} \times \text{AIR}}{\text{IURF} \times \text{EF} \times \text{ED} \times \text{CR}_{\text{building}}}$$

where,

GVIIC	(Groundwater volatilization indoor air inhalation criteria)	= chemical-specific, ug/L
TR	(Target risk level)	= 10 ⁻⁵
AT	(Averaging time)	= 25,550 days (70 x 365)
AIR	(Adjusted inhalation rate)	= 1 (residential) = 2 (nonresidential)
IURF	(Inhalation unit risk factor)	= chemical-specific, (ug/m ³) ⁻¹
EF	(Exposure frequency)	= 350 days/year (residential) = 245 days/year (nonresidential)
ED	(Exposure duration)	= 30 years (residential) = 21 years (nonresidential)
CR _{building}	(Ratio of indoor air concentration to groundwater concentration)	= chemical-specific, (ug/m ³)/(ug/L)

EQUATION FOR NONCARCINOGENIC EFFECTS:

$$\text{GVIIC} = \frac{\text{THQ} \times \text{AT}}{(1/\text{ITSL}) \times \text{EF} \times \text{ED} \times \text{CR}_{\text{building}}}$$

where,

GVIIC	(Groundwater volatilization indoor air inhalation criteria)	= chemical-specific, ug/L
THQ	(Target hazard quotient)	= 1
AT	(Averaging time)	= 10,950 days (residential) = 7,665 days (nonresidential)
EF	(Exposure frequency)	= 350 days/year (residential) = 245 days/year (nonresidential)
ED	(Exposure duration)	= 30 years (residential) = 21 years (nonresidential)
ITSL	(Initial threshold screening level)	= chemical-specific, ug/m ³
CR _{building}	(Ratio of indoor air concentration to groundwater concentration)	= chemical-specific, (ug/m ³)/(ug/L)

The ratio of the indoor air concentration to the groundwater concentration is calculated as:

$$\text{CR}_{\text{building}} = \text{CR}_{\text{source}}^{\text{gw}} \times \alpha$$

where,

CR _{building}	(Ratio of indoor air concentration to groundwater concentration)	= chemical-specific, (ug/m ³)/(ug/L)
α	(Attenuation coefficient)	= chemical-specific, unitless
CR _{source} ^{gw}	(Ratio of soil vapor concentration to groundwater/source concentration)	= chemical-specific, (ug/m ³)/(ug/L)

The soil vapor-phase concentration generated from a hazardous substance in groundwater is assumed to be in equilibrium with the aqueous phase concentration (C_w) of that substance as related by the dimensionless Henry's law constant (H') such that:

$$\text{CR}_{\text{source}}^{\text{gw}} = H' \times \text{TAF} \times C_w \times 10^3 \text{ L/m}^3$$

where,

CR _{source} ^{gw}	(Ratio of soil vapor concentration to groundwater/source concentration)	= chemical-specific, (ug/m ³)/(ug/L)
H'	(Dimensionless Henry's law constant, where $H' = \text{HLC} \times 41$)	= chemical-specific, unitless
HLC	(Henry's law constant at 25 degrees Celsius)	= chemical-specific, (atm-m ³ /mol)
TAF	(Temperature adjustment factor)	= 0.5, unitless
C_w	(Uniform unit groundwater concentration)	= 1 ug/L

The intrusion rate of hazardous substance vapors into buildings is predicted using an analytical solution which couples both diffusive and convective transport of vapors emanating from groundwater into enclosed spaces. An attenuation coefficient (α) is calculated that is expressed as the ratio of building indoor air concentration to the vapor-phase concentration at the source. Values of α are calculated assuming infinite source conditions. For infinite source conditions α is written as follows:

$$\alpha = \frac{\left[\frac{D_T^{\text{eff}} A_b}{Q_{\text{building}} L_T} \times \exp\left(\frac{Q_{\text{soil}} L_{\text{crack}}}{D_{\text{crack}} A_{\text{crack}}}\right) \right]}{\left[\exp\left(\frac{Q_{\text{soil}} L_{\text{crack}}}{D_{\text{crack}} A_{\text{crack}}}\right) + \frac{D_T^{\text{eff}} A_b}{Q_{\text{building}} L_T} + \frac{D_T^{\text{eff}} A_b}{Q_{\text{soil}} L_T} \left[\exp\left(\frac{Q_{\text{soil}} L_{\text{crack}}}{D_{\text{crack}} A_{\text{crack}}}\right) - 1 \right] \right]}$$

where,

α	(Attenuation coefficient)	= unitless
D_T^{eff}	(Total effective diffusion coefficient)	= chemical-specific, cm^2/s
D_{crack}	(Effective diffusion coefficient through crack)	= cm^2/s , ($D_{\text{crack}} = D_v^{\text{eff}}$, see equation for D_v^{eff} below)
A_b	(Area of enclosed space below grade)	= $1.96\text{E}+6 \text{ cm}^2$ (residential) = $3.83\text{E}+6 \text{ cm}^2$ (nonresidential)
Q_{building}	(Building ventilation rate)	= $1.51\text{E}+5 \text{ cm}^3/\text{s}$ (residential) = $5.04\text{E}+5 \text{ cm}^3/\text{s}$ (nonresidential)
L_{crack}	(Building foundation thickness)	= 15 cm
L_T	(Source-building separation distance)	= 115 cm (residential) = 300 cm (nonresidential)
Q_{soil}	(Volumetric flow rate of soil vapor into the building)	= $0.81 \text{ cm}^3/\text{s}$ (residential) = $2.10 \text{ cm}^3/\text{s}$ (nonresidential)
A_{crack}	(Total area of cracks below grade)	= 196 cm^2 (residential) = 383 cm^2 (nonresidential)
$\exp(p)$	(The base of the natural logarithm raised to power p)	= e^p

To characterize contaminant diffusion from groundwater into buildings a total effective diffusion coefficient (D_T^{eff}) is calculated to account for both liquid phase diffusion of the contaminant through the capillary fringe, ($D_{\text{cf}}^{\text{eff}}$), and vapor phase diffusion through the vadose zone, (D_v^{eff}). The calculation is as follows:

$$D_T^{\text{eff}} = \frac{L_T}{\left[(h_v + L_{\text{crack}}) / D_v^{\text{eff}} \right] + (h_{\text{cf}} / D_{\text{cf}}^{\text{eff}})}$$

where,

D_T^{eff}	(Total effective diffusion coefficient)	= chemical-specific, cm ² /s
L_T	(Source-building separation distance)	= 115 cm (residential) = 300 cm (nonresidential)
h_v	(Thickness of vadose zone below enclosed space floor)	= 75 cm (residential) = 260 cm (nonresidential)
L_{crack}	(Building foundation thickness)	= 15 cm
D_v^{eff}	(Effective diffusion coefficient through vadose zone)	= chemical-specific, cm ² /s
h_{cf}	(Thickness of capillary fringe)	= 25 cm
D_{cf}^{eff}	(Effective diffusion coefficient through capillary fringe)	= chemical-specific, cm ² /s

The effective diffusion coefficient calculation for the vadose zone (D_v^{eff}) is written as:

$$D_v^{eff} = \left[D_a \left(\theta_a^{3.33} / n^2 \right) \right] + \left[\frac{D_w}{H' \times TAF} \left(\theta_w^{3.33} / n^2 \right) \right]$$

where,

D_v^{eff}	(Effective diffusion coefficient through vadose zone)	= chemical-specific, cm ² /s
D_a	(Diffusivity in air)	= chemical-specific, cm ² /s
θ_a	(Soil air-filled porosity)	= 0.13 cm ³ /cm ³
N	(Total soil porosity)	= 0.43 cm ³ /cm ³
D_w	(Diffusivity in water)	= chemical-specific, cm ² /s
H'	(Dimensionless Henry's law constant, where $H' = HLC \times 41$)	= chemical-specific, unitless
HLC	(Henry's law constant)	= chemical-specific, (atm-m ³ /mol)
TAF	(Temperature adjustment factor)	= 0.5
θ_w	(Soil water-filled porosity)	= 0.3 cm ³ /cm ³

The effective diffusion coefficient calculation for the capillary fringe (D_{cf}^{eff}) is written as:

$$D_{cf}^{eff} = \left[D_a \left(\theta_{a,cf}^{3.33} / n^2 \right) \right] + \left[\frac{D_w}{H' \times TAF} \left(\theta_{w,cf}^{3.33} / n^2 \right) \right]$$

where,

D_{cf}^{eff}	(Effective diffusion coefficient through capillary fringe)	= chemical-specific, cm ² /s
D_a	(Diffusivity in air)	= chemical-specific, cm ² /s
$\theta_{a,cf}$	(Soil air-filled porosity in capillary fringe)	= 0.078 cm ³ /cm ³
D_w	(Diffusivity in water)	= chemical-specific, cm ² /s

H'	(Dimensionless Henry's law constant, where $H' = HLC \times 41$)	= chemical-specific, unitless
HLC	(Henry's law constant)	= chemical-specific, (atm-m ³ /mol)
TAF	(Temperature adjustment factor)	= 0.5
$\theta_{w,cf}$	(Soil water-filled porosity in capillary fringe)	= 0.352 cm ³ /cm ³
N	(Total soil porosity)	= 0.43 cm ³ /cm ³

(4) Facility-specific measurements of the following parameters may be substituted individually for the generic assumptions and still allow the facility to satisfy the generic categorical criteria under section 20120a(1)(a) to (e) of the act:

- (a) Dry soil bulk density.
- (b) Fraction of organic carbon in soil.
- (c) Soil vapor permeability.
- (d) Temperature adjustment factor for Henry's law constant.
- (e) Source-building foundation separation distance.
- (f) Vertical thickness of capillary fringe.

Facility-specific measurements shall be based on representative characterization. Documentation of all facility specific values shall be provided in the response activity plan, no further action report, or other response activity documentation.

(5) The department may approve methods to demonstrate compliance with criteria for the exposure pathway if those methods are more representative of in-situ conditions at the facility. Methods acceptable to the department may include, but are not limited to, use of representative soil gas concentrations.

R 299.18 Cleanup criteria for soil generally.

Rule 18. (1) The generic cleanup criteria for soil at a facility shall be the most restrictive of the applicable criteria developed under R 299.20 to R 299.28, considering those pathways that are reasonable and relevant at the facility and the category being proposed or implemented.

(2) If a generic soil cleanup criterion developed under R 299.20 to R 299.26 is greater than the C_{sat} concentration for that hazardous substance, then the generic criteria may not apply. A site specific risk evaluation may be conducted for each relevant exposure pathway where free-phase liquids or non-aqueous phase liquids (NAPL) are present.

R 299.20 Generic cleanup criteria for soil based on direct contact.

Rule 20. (1) Cleanup criteria for soil based on direct contact shall be calculated for the generic residential category according to the following algorithms, except as provided in R 299.34(3):

EQUATION FOR CARCINOGENS:

$$DCC = \frac{TR \times AT \times CF}{SF \times [(EF_i \times IF \times AE_i) + (EF_d \times DF \times AE_d)]}$$

where,

DCC	(Direct contact criterion)	=	chemical-specific, ug/kg or ppb
TR	(Target risk level)	=	10^{-5}
AT	(Averaging time)	=	25,550 days (70 years x 365 days/year)
CF	(Conversion factor)	=	$1\text{E}+9$ ug/kg
SF	(Oral cancer slope factor)	=	chemical-specific (mg/kg-day) ⁻¹
EF _i	(Ingestion exposure frequency)	=	350 days/year
IF	(Age-adjusted soil ingestion factor)	=	114 mg-year/kg-day*
AE _i	(Ingestion absorption efficiency)	=	chemical-specific or default specified at R 299.20(3)
EF _d	(Dermal exposure frequency)	=	245 days/year
DF	(Age-adjusted soil dermal factor)	=	353 mg-year/kg-day**
AE _d	(Dermal absorption efficiency)	=	chemical-specific or default specified at R 299.20(3)

EQUATIONS FOR NONCARCINOGENS:

$$\text{DCC} = \frac{\text{THQ} \times \text{RfD} \times \text{AT} \times \text{CF} \times \text{RSC}}{[(\text{EF}_i \times \text{IF} \times \text{AE}_i) + (\text{EF}_d \times \text{DF} \times \text{AE}_d)]}$$

where,

DCC	(Direct contact criterion)	=	chemical-specific (ug/kg or ppb)
THQ	(Target hazard quotient)	=	1
RfD	(Oral reference dose)	=	chemical-specific mg/kg-/day
AT	(Averaging time)	=	10,950 days (30 years x 365 days/year)
CF	(Conversion factor)	=	$1\text{E}+9$ ug/kg
RSC	(Relative source contribution)	=	1
EF _i	(Ingestion exposure frequency)	=	350 days/year
IF	(Age-adjusted soil ingestion factor)	=	114 mg-year/kg-day*
AE _i	(Ingestion absorption efficiency)	=	chemical-specific or default specified at R 299.20(3)
EF _d	(Dermal exposure frequency)	=	245 days/year
DF	(Age-adjusted soil dermal factor)	=	353 mg-year/kg-day**
AE _d	(Dermal absorption efficiency)	=	chemical-specific or default specified at R 299.20(3)

and,

$$* IF = \left(\frac{IR_{\text{age 1-6}} \times ED_{\text{age 1-6}}}{BW_{\text{age 1-6}}} \right) + \left(\frac{IR_{\text{adult}} \times ED_{\text{adult}}}{BW_{\text{adult}}} \right)$$

where,

$IR_{\text{soil/age 1-6}}$	(Soil ingestion rate)	=	200 mg/day
$ED_{\text{age 1-6}}$	(Exposure duration)	=	6 years
$BW_{\text{age 1-6}}$	(Body weight)	=	15 kg
IR_{adult}	(Soil ingestion rate)	=	100 mg/day
ED_{adult}	(Exposure duration)	=	24 years
BW_{adult}	(Body weight)	=	70 kg

and,

$$** DF = \left(\frac{SA_{\text{age 1-6}} \times EV \times AF_{\text{age 1-6}} \times ED_{\text{age 1-6}}}{BW_{\text{age 1-6}}} \right) + \left(\frac{SA_{\text{adult}} \times EV \times AF_{\text{adult}} \times ED_{\text{adult}}}{BW_{\text{adult}}} \right)$$

where,

$SA_{\text{age 1-6}}$	(Skin surface area)	=	2,670 cm ² /dayevent
EV	(Event frequency)	=	1 event/day
$AF_{\text{age 1-6}}$	(Soil adherence factor)	=	0.2 mg/cm ²
$ED_{\text{age 1-6}}$	(Exposure duration)	=	6 years
$BW_{\text{age 1-6}}$	(Body weight)	=	15 kg
SA_{adult}	(Skin surface area)	=	5,800 cm ² /dayevent
AF_{adult}	(Soil adherence factor)	=	0.07 mg/cm ²
ED_{adult}	(Exposure duration)	=	24 years
BW_{adult}	(Body weight)	=	70 kg

(2) Cleanup criteria for soil based on direct contact shall be calculated for the generic nonresidential category according to the following algorithms, except as provided in R 299.34(3):

EQUATION FOR CARCINOGENS:

$$DCC = \frac{TR \times BW \times AT \times CF}{SF \times ED \times [(EF_i \times IR_s \times AE_i) + (EF_d \times SA \times EV \times AF \times AE_d)]}$$

where,

DCC	(Direct contact criterion)	=	chemical-specific, ug/kg or ppb
TR	(Target risk level)	=	10^{-5}
BW	(Body weight)	=	70 kg
AT	(Averaging time)	=	25,550 days (70 years x 365 days/year)
CF	(Conversion factor)	=	1E+9 ug/kg
SF	(Oral cancer slope factor)	=	chemical-specific (mg/kg-day) ⁻¹
ED	(Exposure duration)	=	21 years
EF _i	(Ingestion exposure frequency)	=	245 days/year
IR _s	(Soil ingestion rate)	=	100 mg/day (residential)
AE _i	(Ingestion absorption efficiency)	=	chemical-specific or default specified at R 299.20(3)
EF _d	(Dermal exposure frequency)	=	160 days/year
SA	(Skin surface area)	=	3,300 cm ² /day event
EV	(Event frequency)	=	1 event/day
AF	(Soil adherence factor)	=	0.2 mg/cm ² (nonresidential)
AE _d	(Dermal absorption efficiency)	=	chemical-specific or default specified at R 299.20(3)

EQUATION FOR NONCARCINOGENS:

$$DCC = \frac{THQ \times RfD \times BW \times AT \times CF \times RSC}{ED \times [(EF_i \times IR_s \times AE_i) + (EF_d \times SA \times EV \times AF \times AE_d)]}$$

where,

DCC	(Direct contact criterion)	=	chemical-specific, ug/kg or ppb
THQ	(Target hazard quotient)	=	1
RfD	(Oral reference dose)	=	chemical-specific, mg/kg-/day
BW	(Body weight)	=	70 kg
AT	(Averaging time)	=	7,665 days (21 years x 365 days/year)
CF	(Conversion factor)	=	1E+9 ug/kg
RSC	(Relative source contribution)	=	1
ED	(Exposure duration)	=	21 years
EF _i	(Ingestion exposure frequency)	=	245 days/year
IR _s	(Soil ingestion rate)	=	100 mg/day
AE _i	(Ingestion absorption efficiency)	=	chemical-specific or default specified at R 299.20(3)
EF _d	(Dermal exposure frequency)	=	160 days/year
SA	(Skin surface area)	=	3,300 cm ² /day event
EV	(Event frequency)	=	1 event/day
AF	(Soil adherence factor)	=	0.2 mg/cm ² (nonresidential)
AE _d	(Dermal absorption efficiency)	=	chemical-specific or default specified at R 299.20(3)

(3) Absorption efficiencies used to calculate generic direct contact criteria are as follows:

(a) Chemical-specific data may be submitted to the department to support development of a new generic criterion under R 299.6(9) or (10) and shall be used in this rule if determined by the department to be the best available information.

(b) If chemical-specific data are not available, then the following default absorption efficiencies shall be used:

(i) AE_i shall be 50% for organic hazardous substances which exhibit a log octanol water partitioning coefficient greater than 5 and a molecular weight greater than 200 grams per mole or which are not ionizing organic compounds, and 100% for all other organic hazardous substances.

(ii) AE_i shall be 50% for inorganic hazardous substances.

(iii) AE_d shall be assumed to be 10% for organic hazardous substances.

(iv) AE_d shall be assumed to be 1% for inorganic hazardous substances.

(4) To demonstrate compliance with generic direct contact criteria, the criteria shall be applied without regard to the depth of contaminated soil.

R 299.22 Generic cleanup criteria for soil based on leaching of hazardous substances into groundwater.

Rule 22. (1) To assure that soils do not pose a threat of aquifer contamination, the concentration of the hazardous substance in soil shall be below that which produces a concentration in leachate that is equal to the least restrictive of the applicable groundwater criteria specified in subdivisions (a) to (c) of this subrule, or below a criterion based on the soil-water partitioning characteristics of a hazardous substance as provided in subrule (4) of this rule, whichever is higher. The selection of the following least restrictive value, and comparison to the soil-water partitioning value, shall be done separately for each pathway that is relevant at the facility:

(a) The groundwater criteria developed under R 299.8 to 299.14.

- (b) The leachate concentration generated by background soil.
- (c) The groundwater concentration allowed by target detection limit, if it is higher than a risk-based criterion that would otherwise be the most restrictive.

(2) Leachate testing is not required to demonstrate compliance with subrule (1) of this rule if the total concentration of a hazardous substance in soil does not exceed 20 times the lowest groundwater cleanup criterion that is applicable at the facility or does not exceed the soil-water partitioning value established under subrule (4) of this rule, whichever is higher.

(3) Leachate concentrations shall be determined by a method that best represents in-situ conditions. For the purposes of this rule, the following test methods are acceptable:

(a) The United States environmental protection agency's toxicity characteristic leaching procedure (TCLP) (revised as of July 1992) or the synthetic precipitation leachate procedure (SPLP) (revised as of September 1994) as set forth in SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, (revised to include Update III, June 13, 1997), published by the United States Environmental Protection Agency, which are adopted by reference in these rules and which are available for inspection at the Lansing office of the department, 525 West Allegan Street, Lansing, Michigan. Copies of the provisions may be purchased at a cost as of the time of adoption of these rules of \$239.00 from the National Technical Information Service, United States Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161 (publication number PB97-156111GEI), or from the Department of Environmental Quality, Remediation and Redevelopment Division, 525 West Allegan, Lansing, Michigan 48909, at cost.

(b) Other methods accepted by the department to more accurately simulate conditions at the site than the test methods specified in subdivision (a) of this subrule.

(4) The department may, if adequate data are available, establish acceptable soil concentrations based on soil-water partitioning characteristics of a hazardous substance.

R 299.24 Generic cleanup criteria for soil based on indoor inhalation of hazardous substance vapors volatilized from soil.

Rule 24. (1) Indoor inhalation of hazardous substance vapors volatilizing to indoor air from soil shall be considered a reasonable and relevant exposure pathway only for hazardous substances that have a Henry's law constant greater than or equal to 0.00001 atm-m³/mole.

(2) Except as provided in subrule (1) of this rule, if any of the following conditions exist, the generic criteria developed pursuant to this rule shall not apply and a site-specific evaluation of indoor inhalation risks shall be conducted:

(a) There is a structure present or planned to be constructed at the facility which does not have a concrete block or poured concrete floor and walls.

(b) There is a sump present that is not completely isolated from the surrounding soil by its materials of construction.

(3) Soil cleanup criteria based on indoor inhalation of volatile emissions from hazardous substances in soil shall be called soil volatilization indoor air inhalation criteria ("SVIIC"). The SVIIC is determined by the following series of calculations, except as provided in R 299.34(3):

EQUATION FOR CARCINOGENIC EFFECTS:

$$SVIIC = \frac{TR \times AT \times AIR}{IURF \times EF \times ED \times CR_{\text{building}}}$$

where,

SVIIC	(Soil volatilization indoor air inhalation criterion)	= chemical-specific, ug/kg
TR	(Target risk level)	= 10^{-5}
AT	(Averaging time)	= 25,550 days (70 years x 365 days/year)
AIR	(Adjusted inhalation rate)	= 1 (residential) = 2 (nonresidential)
IURF	(Inhalation unit risk factor)	= chemical-specific, $(\text{ug}/\text{m}^3)^{-1}$
EF	(Exposure frequency)	= 350 days/year (residential) = 245 days/year (nonresidential)
ED	(Exposure duration)	= 30 years (residential) = 21 years (nonresidential)
CR _{building}	(Ratio of indoor air concentration to soil concentration)	= chemical-specific, $(\text{ug}/\text{m}^3)/(\text{ug}/\text{kg})$

EQUATION FOR NONCARCINOGENIC EFFECTS:

$$\text{SVIIC} = \frac{\text{THQ} \times \text{AT}}{(1/\text{ITSL}) \times \text{EF} \times \text{ED} \times \text{CR}_{\text{building}}}$$

where,

SVIIC	(Soil volatilization indoor air inhalation criterion)	= chemical-specific, ug/kg
THQ	(Target hazard quotient)	= 1
AT	(Averaging time)	= 10,950 days (residential) = 7,665 days (nonresidential)
EF	(Exposure frequency)	= 350 days/year (residential) = 245 days/year (nonresidential)
ED	(Exposure duration)	= 30 years (residential) = 21 years (nonresidential)
ITSL	(Initial threshold screening level)	= chemical-specific, ug/m ³
CR _{building}	(Ratio of indoor air concentration to soil concentration)	= chemical-specific, (ug/m ³)/(ug/kg)

The contaminant vapor concentration in the building indoor air is written as:

$$CR_{\text{building}} = CR_{\text{source}}^{\text{soil}} \times \alpha$$

where,

CR _{building}	(Ratio of indoor air concentration to soil concentration)	= chemical-specific, (ug/m ³)/(ug/kg)
α	(Attenuation coefficient)	= chemical-specific, Unitless
CR _{source} ^{soil}	(Ratio of soil vapor concentration to soil/source concentration)	= chemical-specific, (ug/m ³)/(ug/kg)

The vapor-phase contaminant concentration at the source for soil is written as:

$$CR_{\text{source}}^{\text{soil}} = \frac{H' \times TAF \times C_s \times \rho_b \times 10^{-3} \text{ kg/g} \times 10^6 \text{ cm}^3/\text{m}^3}{\theta_w + (k_d \times \rho_b) + (H' \times TAF \times \theta_a)}$$

where,

CR_{source}^{soil}	(Ratio of soil vapor concentration to soil/source concentration)	= chemical-specific, (ug/m^3)/(ug/kg)
H'	(Dimensionless Henry's law constant, where $H' = HLC \times 41$)	= chemical-specific, unitless
HLC	(Henry's law constant at 25 degrees Celsius)	= chemical-specific, ($atm \cdot m^3/mol$)
TAF	(Temperature adjustment factor)	= 0.5, unitless
C_s	(Uniform concentration in soil)	= 1 ug/kg
ρ_b	(Dry soil bulk density)	= 1.5 g/cm^3
θ_w	(Soil water-filled porosity)	= 0.3 cm^3/cm^3
k_d	(Soil-water partition coefficient)	= chemical-specific, cm^3/g (equivalent to L/kg)
	For organic compounds	= $K_{oc} (cm^3/g) \times f_{oc} (g/g)$
	For inorganic compounds	= chemical-specific, cm^3/g
K_{oc}	(Soil organic carbon partition coefficient)	= chemical-specific, cm^3/g
f_{oc}	(Fraction of organic carbon content of soil)	= 0.002 g/g (0.2%)
θ_a	(Soil air-filled porosity)	= 0.13 cm^3/cm^3

The intrusion rate of hazardous substance vapors into buildings is predicted using an analytical solution which couples both diffusive and convective transport of vapors emanating from subsurface soil into enclosed spaces. An attenuation coefficient (α) is calculated that is expressed as the ratio of building indoor air concentration to the vapor-phase concentration at the source. Values of α are calculated assuming infinite source conditions. For infinite source conditions α is written as follows:

$$\alpha = \frac{\left[\frac{D_v^{eff} A_b}{Q_{building} L_T} \right] \times \exp\left(\frac{Q_{soil} L_{crack}}{D_{crack} A_{crack}} \right)}{\left[\exp\left(\frac{Q_{soil} L_{crack}}{D_{crack} A_{crack}} \right) + \frac{D_v^{eff} A_b}{Q_{building} L_T} \right] + \left[\frac{D_v^{eff} A_b}{Q_{soil} L_T} \right] \left[\exp\left(\frac{Q_{soil} L_{crack}}{D_{crack} A_{crack}} \right) - 1 \right]}$$

where,

α	(Attenuation coefficient)	= unitless
D_v^{eff}	(Effective diffusion coefficient through vadose zone)	= chemical-specific, cm^2/s
D^{crack}	(Effective diffusion coefficient through crack)	= cm^2/s , ($D^{\text{crack}} = D_v^{\text{eff}}$, see equation for D_v^{eff} below)
A_b	(Area of enclosed space below grade)	= $1.96\text{E}+6 \text{ cm}^2$ (residential) = $3.83\text{E}+6 \text{ cm}^2$ (nonresidential)
Q_{building}	(Building ventilation rate)	= $1.51\text{E}+5 \text{ cm}^3/\text{s}$ (residential) = $5.04\text{E}+5 \text{ cm}^3/\text{s}$ (nonresidential)
L_{crack}	(Building foundation thickness)	= 15 cm
L_T	(Source-building separation distance)	= 15 cm (All land use categories)
Q_{soil}	(Volumetric flow rate of soil vapor into the building)	= $0.81 \text{ cm}^3/\text{s}$ (residential) = $2.10 \text{ cm}^3/\text{s}$ (nonresidential)
A_{crack}	(Total area of cracks below grade)	= 196 cm^2 (residential) = 383 cm^2 (nonresidential)
$\exp(p)$	(The base of the natural logarithm raised to power p)	= e^p

The effective diffusion coefficient calculation for the vadose zone (D_v^{eff}) is written as:

$$D_v^{\text{eff}} = \left[D_a (\theta_a^{3.33} / n^2) \right] + \left[\frac{D_w}{H' \times \text{TAF}} (\theta_w^{3.33} / n^2) \right]$$

where,

D_v^{eff}	(Effective diffusion coefficient through vadose zone)	= chemical-specific, cm^2/s
D_a	(Diffusivity in air)	= chemical-specific, cm^2/s
θ_a	(Soil air-filled porosity)	= $0.13 \text{ cm}^3/\text{cm}^3$
n	(Total soil porosity)	= $0.43 \text{ cm}^3/\text{cm}^3$
D_w	(Diffusivity in water)	= chemical-specific, cm^2/s
H'	(Dimensionless Henry's law constant, where $H' = \text{HLC} \times 41$)	= chemical-specific, unitless
HLC	(Henry's law constant)	= chemical-specific, $(\text{atm}\cdot\text{m}^3/\text{mol})$
θ_w	(Soil water-filled porosity)	= $0.3 \text{ cm}^3/\text{cm}^3$

(4) Facility-specific measurements of the following parameters may be substituted individually for the generic assumptions and still allow the facility to satisfy the categorical criteria in section 20120a(1)(a) to (e) of the act:

- (a) Dry soil bulk density.
- (b) Fraction of organic carbon in soil.
- (c) Soil vapor permeability.
- (d) Temperature adjustment factor for Henry's law constant.

Facility-specific measurements shall be based on representative characterization. Documentation of all facility specific values shall be provided in the response activity plan or no further action report.

(5) The department may approve methods to demonstrate compliance with criteria for this exposure pathway if those methods are more representative of in-situ conditions at the facility. Methods acceptable to the department may include, but are not limited to, evaluation of representative soil gas concentrations.

R 299.26 Generic cleanup criteria for soil based on inhalation of hazardous substances in ambient air.

Rule 26. (1) Inhalation of hazardous substance emissions in ambient air from soil shall be considered a reasonable and relevant pathway for all facilities.

(2) Generic cleanup criteria for soil based on inhalation of volatile hazardous substance emission to ambient air shall be called volatile soil inhalation criteria (VSIC). Generic cleanup criteria for soil based on inhalation of particulate hazardous substance emission to ambient air shall be called particulate soil inhalation criteria (PSIC). The generic residential VSIC and PSIC are calculated as follows, except as provided in R 299.34(3):

EQUATIONS FOR CARCINOGENS:

$$VSIC = \frac{TR \times AT}{IURF \times EF \times ED \times (1/VF)}$$

where,

VSIC	(Volatile soil inhalation criterion)	= chemical-specific, ug/kg or ppb
TR	(Target risk level)	= 10^{-5}
AT	(Averaging time)	= 25,550 days (70 years x 365 days/year)
IURF	(Inhalation unit risk factor)	= chemical-specific (ug/m ³) ⁻¹
EF	(Exposure frequency)	= 350 days/year
ED	(Exposure duration)	= 30 years
VF	(Volatilization factor)	= chemical-specific, m ³ /kg

and,

$$PSIC = \frac{TR \times AT}{IURF \times EF \times ED \times (1/PEF)}$$

where,

PSIC	(Particulate soil inhalation criterion)	= chemical-specific, ug/kg or ppb
TR	(Target risk level)	= 10^{-5}
AT	(Averaging time)	= 25,550 days (70 years x 365 days/year)
IURF	(Inhalation unit risk factor)	= chemical-specific (ug/m ³) ⁻¹
EF	(Exposure frequency)	= 350 days/year
ED	(Exposure duration)	= 30 years
PEF	(Particulate emission factor)	= chemical-specific, m ³ /kg

EQUATIONS FOR NONCARCINOGENS:

$$VSIC = \frac{THQ \times AT}{EF \times ED \times (1/ITSL \times 1/VF)}$$

where,

VSIC	(Volatile soil inhalation criterion)	= chemical-specific, ug/kg or ppb
THQ	(Target hazard quotient)	= 1
AT	(Averaging time)	= 10,950 days (30 years x 365 days/year)
EF	(Exposure frequency)	= 350 days/year
ED	(Exposure duration)	= 30 years
ITSL	(Initial threshold screening level)	= chemical-specific, ug/m ³
VF	(Volatilization factor)	= chemical-specific, m ³ /kg

and,

$$PSIC = \frac{THQ \times AT}{EF \times ED \times (1/ITSL \times 1/PEF)}$$

where,

PSIC	(Particulate soil inhalation criterion)	= chemical-specific, ug/kg or ppb
THQ	(Target hazard quotient)	= 1
AT	(Averaging time)	= 10,950 days (30 years x 365 days/year)
EF	(Exposure frequency)	= 350 days/year
ED	(Exposure duration)	= 30 years
ITSL	(Initial threshold screening level)	= chemical-specific, ug/m ³
PEF	(Particulate emission factor)	= chemical-specific, m ³ /kg

(3) The soil to air volatilization factor (VF) relates the concentration of a contaminant in the soil to the concentration of volatilized contaminant in the ambient air. If the vertical extent of the contaminant

source has not been characterized, then the VF shall be calculated based on the infinite equation presented in subdivision (a) of this subrule. If the vertical extent of the contaminant source has been adequately characterized throughout the facility, then the VF shall be calculated either by the finite source equation presented in subdivision (b) of this subrule or the mass balance equation presented in subdivision (c) of this subrule, whichever yields the highest VSIC.

$$(a) \quad VF = (Q/C) \times (1/J_s^{ave})$$

J_s^{ave} , using the infinite source model shall be calculated as follows:

$$J_s^{ave} = \rho_b (4D_A/\pi t)^{1/2} \times 10^4 \text{ cm}^2/\text{m}^2$$

and D_A shall be calculated as:

$$D_A = \frac{[(\theta_a^{3.33} D_a (H' \times TAF) + \theta_w^{3.33} D_w)/n^2]}{\rho_b K_d + \theta_w + \theta_a (H' \times TAF)}$$

where,

VF	(Volatilization factor)	=	chemical-specific, m^3/kg
J_s^{ave}	(Normalized average flux from soil)	=	chemical-specific, $\text{g}/\text{m}^2\text{-second}$
D_A	(Apparent diffusivity)	=	chemical-specific, $\text{cm}^2/\text{second}$
Q/C	(Dispersion factor for 1/2 acre)	=	82.33, $\text{g}/\text{m}^2\text{-second per kg}/\text{m}^3$
T	(Exposure time)	=	seconds (ED x 3.1536E+7 seconds/yr)
θ_a	(Soil air-filled porosity)	=	0.28 L_{air}/L_{soil}
N	(Total soil porosity)	=	0.43 L_{pore}/L_{soil}
θ_w	(Soil water-filled porosity)	=	0.15 L_{water}/L_{soil}
ρ_b	(Dry soil bulk density)	=	1.5 g/cm^3
D_a	(Diffusivity in air)	=	chemical-specific, $\text{cm}^2/\text{second}$
D_w	(Diffusivity in water)	=	chemical-specific, $\text{cm}^2/\text{second}$
H'	(Dimensionless Henry's law constant, where $H' = \text{HLC} \times 41$)	=	chemical-specific, unitless
HLC	(Henry's law constant at 25 ⁰ C)	=	chemical-specific, $\text{atm-m}^3/\text{mol}$
TAF	(Temperature adjustment factor)	=	0.5
K_d	(Soil-water partition coefficient)	=	chemical-specific, cm^3/g
	For organic compounds	=	$K_{oc} (\text{cm}^3/\text{g}) \times f_{oc} (\text{g}/\text{g})$
	For inorganic compounds	=	chemical-specific, cm^3/g
K_{oc}	(Soil organic carbon partition coefficient)	=	chemical-specific, cm^3/g
f_{oc}	(Organic carbon content of soil)	=	0.006 g/g (0.6%)

(b) The simplified finite source model equation for VF shall be calculated as follows:

$$VF = (Q/C) \times (C_0 / \rho_b) \times (1/J_s^{ave})$$

and,

$$J_s = C_0 (D_A / \pi t)^{1/2} [1 - \exp(-d_s^2 / 4D_A t)]$$

where,

VF	(Volatilization factor)	=	chemical-specific, m ³ /kg
Q/C	(Dispersion factor for 1/2 acre)	=	82.33, g/m ² -second per kg/m ³
C ₀	(Uniform contaminant concentration at t=0)	=	1.5 E-6 g/cm ³
ρ _b	(Dry soil bulk density)	=	1.5 g/cm ³
J _s ^{ave}	(Normalized average flux from soil)	=	chemical-specific, g/m ² -second
J _s	(Instantaneous flux from soil at time t)	=	chemical-specific, g/m ² -second
D _A	(Apparent diffusivity - see equation above)	=	chemical-specific, cm ² /second
T	(Time)	=	seconds
d _s	(Thickness of source)	=	site-specific, meters
exp(p)	(The base of the natural logarithm raised to power (p))	=	e ^p

(c) Mass balance VF shall be calculated as follows:

$$VF = (Q/C) \times \frac{AT \times (3.15 \times 10^{-7} \text{ seconds/year})}{\rho_b \times d_s \times 10^6 \text{ g/Mg}}$$

where,

VF	(Volatilization factor)	=	chemical-specific, m ³ /kg
Q/C	(Dispersion factor for 1/2 acre)	=	82.33, g/m ² -second per kg/m ³
AT	(Exposure period)	=	scenario-specific, years
ρ _b	(Dry soil bulk density)	=	1.5 mg/m ³
d _s	(Average source depth)	=	site-specific, meters

(4) The particulate emission factor shall be calculated as follows:

$$PEF = (Q/C) \times 1 / [(Ew \times (1 - V)) + Ev]$$

where,

PEF	(Particulate emission factor)	=	chemical-specific, m ³ /kg
Q/C	(Dispersion factor for 1/2 acre)	=	82.33, g/m ² -second per kg/m ³
Ew	(Emission due to wind)	=	g/m ² per second
Ev	(Emission due to vehicle traffic)	=	g/m ² per second
V	(Vegetative cover)	=	0.5 (50%), unitless

(5) VSIC and PSIC for nonresidential facilities shall be calculated as follows, except as provided in R 299.34(3):

EQUATIONS FOR CARCINOGENS:

$$VSIC = \frac{TR \times AT \times AIR}{IURF \times EF \times ED \times (1/VF)}$$

where,

VSIC	(Volatile soil inhalation criterion)	=	chemical-specific, ug/kg or ppb
TR	(Target risk level)	=	10 ⁻⁵
AT	(Averaging time)	=	25,550 days (70 years x 365 days/year)
AIR	(Adjusted inhalation rate)	=	(20 m ³ /day)/(10 m ³ /day)
IURF	(Inhalation unit risk factor)	=	chemical-specific (ug/m ³) ⁻¹
EF	(Exposure frequency)	=	245 days/year
ED	(Exposure duration)	=	21 years
VF	(Volatilization factor)	=	chemical-specific, m ³ /kg

and,

$$PSIC = \frac{TR \times AT \times AIR}{IURF \times EF \times ED \times (1/PEF)}$$

where,

PSIC	(Particulate soil inhalation criterion)	= chemical-specific, ug/kg or ppb
TR	(Target risk level)	= 10^{-5}
AT	(Averaging time)	= 25,550 days (70 years x 365 days/year)
AIR	(Adjusted inhalation rate)	= $(20 \text{ m}^3/\text{day})/(10 \text{ m}^3/\text{day})$
IURF	(Inhalation unit risk factor)	= chemical-specific $(\text{ug}/\text{m}^3)^{-1}$
EF	(Exposure frequency)	= 245 days/year
ED	(Exposure duration)	= 21 years
PEF	(Particulate emission factor)	= chemical-specific, m^3/kg

EQUATIONS FOR NONCARCINOGENS:

$$\text{VSIC} = \frac{\text{THQ} \times \text{AT}}{\text{EF} \times \text{ED} \times (1/\text{ITSL} \times 1/\text{VF})}$$

where,

VSIC	(Volatile soil inhalation criterion)	= chemical-specific, ug/kg or ppb
THQ	(Target hazard quotient)	= 1
AT	(Averaging time)	= 7,665 days (21 years x 365 days/year)
EF	(Exposure frequency)	= 245 days/year
ED	(Exposure duration)	= 21 years
ITSL	(Initial threshold screening level)	= chemical-specific, ug/m^3
VF	(Volatilization factor)	= chemical-specific, m^3/kg

and,

$$\text{PSIC} = \frac{\text{THQ} \times \text{AT}}{\text{EF} \times \text{ED} \times (1/\text{ITSL} \times 1/\text{PEF})}$$

where,

PSIC	(Particulate soil inhalation criterion)	= chemical-specific, ug/kg or ppb
THQ	(Target hazard quotient)	= 1
AT	(Averaging time)	= 7,665 days (21 years x 365 days/year)
EF	(Exposure frequency)	= 245 days/year
ED	(Exposure duration)	= 21 years
ITSL	(Initial threshold screening level)	= chemical-specific, ug/m ³
PEF	(Particulate emission factor)	= chemical-specific, m ³ /kg

(6) The generic SIC are calculated for a source area size of 1/2 acre. The generic SIC shall be adjusted for other source area sizes by multiplying the generic SIC by the modifiers given in the following table. Where the actual source area size falls between the sizes given in this subrule, generic SIC shall be multiplied by the modifier for the next largest source size.

Modifiers		
Source Size (ft ² or acres)	Q/C (g/m ² -s per kg/m ³)	Modifier
400 ft ²	261.26	3.17
1000 ft ²	180.76	2.2
2000 ft ²	144.91	1.76
¼ acre	94.56	1.15
½ acre	82.33	1
1 acre	71.74	0.87
2 acres	63.51	0.77
5 acres	54.62	0.66
10 acres	49.13	0.6
32 acres	41.55	0.5
100 acres	35.66	0.43

(7) Facility-specific measurements of the following parameters may be substituted for the generic assumptions and still allow the facility to satisfy the categorical criteria in section 20120a(1)(a) to (e) of the act:

- (a) Dry soil bulk density (ρ_b).
- (b) Soil water-filled porosity (θ_w).
- (c) Soil air-filled porosity (θ_a).
- (d) Fraction of organic carbon in soil (f_{oc}).
- (e) Emission due to wind (E_w).
- (f) Dispersion factor (Q/C).

Facility-specific measurements shall be based on representative characterization. Documentation of all facility-specific values shall be provided in the response activity plan, no further action report, or other response activity documentation.

(8) A person who is implementing response activity may demonstrate compliance with the generic criteria developed under this rule through the collection and analysis of ambient air samples within the facility boundaries, if the hazardous substance concentration in surficial soil is representative of facility conditions.

R 299.28 Cleanup criteria for contaminated environmental media based on other injury which requires consideration.

Rule 28. (1) To assure that hazardous substances in contaminated environmental media do not pose unacceptable risks not accounted for by other rules in this part, the concentration of a hazardous substance in a given environmental medium shall meet cleanup criteria based on sound scientific principles and determined by the department to be necessary to protect the public health, safety, and welfare and the environment from any of the following:

- (a) Food chain contamination.
- (b) Damage to soil or biota in the soil that impairs the use of such soil for agricultural purposes.
- (c) Phytotoxicity.
- (d) Physical hazards.
- (e) Nonsystemic or acute toxicity.
- (f) Injury that may result from the direct transport or runoff of hazardous substances in soil into surface water.
- (g) Injury to the groundwater resource which may impair its use for other purposes that are determined by the department to be reasonable and relevant considerations at a facility.
- (h) Other injury that requires consideration.

(2) The basis for and information used by the department to develop cleanup criteria under this rule shall be made available to the public upon request.

R 299.30 Surface water and surface water sediments; cleanup criteria.

Rule 30. (1) Any response activity plan that addresses surface water or sediments associated with waters of the state shall include site-specific cleanup criteria established by the department on the basis of sound scientific principles and evaluation of bulk sediment chemistry, sediment toxicity, and benthic community populations. Criteria shall be established considering the need to eliminate or mitigate the following use impairments, as appropriate to the facility in question:

- (a) Restrictions on fish or wildlife consumption.
- (b) Tainting of fish and wildlife flavor.
- (c) Degraded fish or wildlife populations.
- (d) Fish tumors or other deformities.
- (e) Bird or animal deformities or reproductive problems.
- (f) Degradation of benthos.
- (g) Restrictions on dredging activities.
- (h) Eutrophication or undesirable algae.
- (i) Restrictions on drinking water consumption or taste or odor problems.
- (j) Beach closings.
- (k) Degradation of aesthetics.
- (l) Added costs to agriculture, industry, or a local unit of government.
- (m) Degradation of phytoplankton or zooplankton populations.
- (n) Loss of fish and wildlife habitat.
- (o) Unacceptable risk through human contact as a result of absorption of hazardous substances through the skin or by incidental ingestion of sediments.

- (p) Other unacceptable risks to human receptors exposed to hazardous substances in sediments.
- (2) The basis for, and information used by the department to develop, cleanup criteria under this rule shall be made available to the public upon request.

R 299.34 Risk assessment and development of cleanup criteria for certain substances; special considerations.

Rule 34. (1) All polychlorinated and polybrominated dibenzodioxins and dibenzofurans shall be considered as 1 hazardous substance, expressed as an equivalent concentration of 2,3,7,8-tetrachlorodibenzo-p-dioxin, based upon the relative potency and concentration of the congeners present at the facility.

(2) If 2 or more hazardous substances are present and known to result in toxicological interaction, then the interactive effects shall be considered in establishing levels that are protective of the public health, safety, and welfare and the environment.

(3) The department may calculate generic cleanup criteria for certain hazardous substances using exposure assumptions other than those shown in the algorithms in these rules if either of the following conditions is satisfied:

(a) A hazardous substance causes an adverse effect in a sensitive subpopulation that is not adequately protected or represented by the generic exposure assumptions.

(b) The toxicokinetics of a hazardous substance are not best represented by the average daily dose, when accounting for the most sensitive effect.

R 299.36 Calculation of criteria based on noncarcinogenic endpoints; minimum toxicity data.

Rule 36. (1) The minimum data required to calculate a cleanup criterion for a noncarcinogen when the route of exposure is ingestion or dermal absorption shall be the reference dose that is determined on the basis of the best available information and considering the weight of evidence.

(2) The minimum data required to calculate a cleanup criterion for a noncarcinogen when the route of exposure is inhalation shall be the minimum data required for calculation of an initial threshold screening level developed under part 55 of the act, and rules promulgated under part 55.

R 299.38 Determination of cancer slope factors for use in calculation of criteria based on carcinogenic endpoints.

Rule 38. (1) A non-threshold mechanism of carcinogenesis shall be assumed unless biological data adequately demonstrate the existence of a threshold on a hazardous substance-specific basis.

(2) All appropriate human epidemiologic data, animal cancer bioassay data, and all other pertinent data shall be considered and a cancer slope factor developed if the weight of evidence for carcinogenicity is sufficient. Preferred data are those from studies which use the same route of exposure addressed by the criteria. However, in the absence of such data, route-to-route extrapolations may be conducted where appropriate, considering whether the critical effect is systemic and thus possible for each different route of exposure. The risk-associated dose shall be set at a level corresponding to an increased cancer risk of 1 in 100,000. If acceptable human epidemiologic data are available for a hazardous substance, then those data shall be used to derive the risk-associated dose. If acceptable human epidemiologic data are not available, then the risk-associated dose shall be derived from available animal bioassay data. Data from a species that is considered most biologically relevant to humans, that is, responds most like humans, is preferred where all other considerations regarding quality of data are equal. In the absence of data to distinguish the most relevant species, data from the most sensitive species tested, that is the species showing a carcinogenic effect at the lowest administered dose, shall generally be used.

(3) If animal bioassay data are used and a non-threshold mechanism of carcinogenicity is assumed, then the data shall be fitted to a linearized multistage model, for example, a Global '86 or equivalent

computer model. Global '86 is the linearized multistage model that was derived by Howe, Crump, and Van Landingham (1986), which was prepared for the United States environmental protection agency under subcontract 2-251u-2745 to Research Triangle Institute, contract 68-01-6826, and which the United States environmental protection agency uses to determine cancer potencies. The upper-bound 95% confidence limit on risk, or the lower 95% confidence limit on dose, at the 1 in 100,000 risk level shall be used to calculate a risk-associated dose for individual hazardous substances. Other models, including modifications or variations of the linearized multistage model that are more appropriate to the available data, may be used where scientifically justified.

(4) If the duration of the study is significantly less than the natural lifespan of the test animal, then the slope factor may be adjusted on a case-by-case basis to compensate for latent tumors that were not expressed. The lifespan of a rat is assumed to be 104 weeks and the lifespan of a mouse is assumed to be 90 weeks. If the test animal is a rat and the study duration is less than 90 weeks, or if the test animal is a mouse and the study duration is less than 78 weeks, then the slope factor shall be multiplied by the following factor: the expected lifespan (L) divided by the study duration (L_e) raised to the third power, $[(L/L_e)^3]$.

(5) A species scaling factor shall be used to account for differences between test species and humans. It shall be assumed that scaling daily administered doses by body mass raised to the $3/4$ power achieves equivalence in lifetime carcinogenic risk in different mammalian species. To derive a human slope factor from animal data, the default procedure shall be to multiply the animal slope factor by the ratio of human to animal body weights raised to the $1/4$ power. However, if adequate pharmacokinetic and metabolism studies are available, then these data may be factored into the adjustment for species differences on a case-by-case basis.

(6) Additional adjustments shall be made to the data as appropriate. For some cancer data sets, it may be appropriate to combine incidences of multiple tumor types or combine benign and malignant tumors of the same histogenic origin. All doses shall be adjusted to give an average daily dose over the study duration. Adjustments shall be made to the tumor incidence for early mortality. Animals dying before the appearance of the first tumor within their dose group shall be removed from the data set. Before quantification of the dose response, a goodness-of-fit evaluation of the data shall be conducted.

(7) If human epidemiologic data, animal bioassay data, or other biological data indicate that a chemical causes cancer via a threshold mechanism, then the risk-associated dose may, on a case-by-case basis, be calculated using a method that assumes a threshold mechanism is operative.

(8) Inhalation unit risk factors shall be calculated in the same manner as cancer risk screening levels for inhalation risk under part 55 of the act.

R 299.40 Availability of information used by department to establish cleanup criteria; public review and comment on revised criteria.

Rule 40. (1) The department shall make available to the public the detailed basis for calculation of any cleanup criterion established under these rules, including the references for original studies, papers, or other sources of information that were used or considered. Requests for information under this rule shall specify the hazardous substance and exposure pathways for which information is desired.

(2) Any proposed change to a criterion shall be published by the department and subject to review and comment as part of the rule-making process.

R 299.44 Generic groundwater cleanup criteria.

Rule 44. The generic groundwater cleanup criteria for all categories shall be as shown in table 1.

**TABLE 1. GROUNDWATER: RESIDENTIAL AND NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS**

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to 1 microgram per liter (ug/L). Criteria with 6 or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (§324.20120a(10)). In these cases, 2 numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based or solubility value, whichever is lower.

Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	Water Solubility	Flammability and Explosivity Screening Level
Acenaphthene	83329	1,300	3,800	38	4,200 (S)	4,200 (S)	4,240	ID
Acenaphthylene	208968	52	150	ID	3,900 (S)	3,900 (S)	3,930	ID
Acetaldehyde (I)	75070	950	2,700	130	1.1E+6	2.3E+6	1.00E+9	8.9E+6
Acetate	71501	4,200	12,000	(G)	ID	ID	ID	ID
Acetic acid	64197	4,200	12,000	(G)	NLV	NLV	6.00E+9	1.0E+9 (D)
Acetone (I)	67641	730	2,100	1,700	1.0E+9 (D,S)	1.0E+9 (D,S)	1.00E+9	1.5E+7
Acetonitrile	75058	140	400	NA	2.4E+7	4.5E+7	2.00E+8	2.1E+7
Acetophenone	98862	1,500	4,400	ID	6.1E+6 (S)	6.1E+6 (S)	6.10E+6	ID
Acrolein (I)	107028	120	330	NA	2,100	4,200	2.10E+8	6.7E+6
Acrylamide	79061	0.5 (A)	0.5 (A)	10 (X)	NLV	NLV	2.20E+9	NA
Acrylic acid	79107	3,900	11,000	NA	1.2E+7	2.8E+7	1.00E+9	1.0E+9 (D)
Acrylonitrile (I)	107131	2.6	11	2.0 (M); 1.2	34,000	1.9E+5	7.50E+7	6.4E+6
Alachlor	15972608	2.0 (A)	2.0 (A)	11 (X)	NLV	NLV	1.83E	ID

Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	Water Solubility	Flammability and Explosivity Screening Level
							+5	
Aldicarb	116063	3.0 (A)	3.0 (A)	NA	NLV	NLV	6.00E+6	ID
Aldicarb sulfone	1646884	2.0 (A)	2.0 (A)	NA	NLV	NLV	7.80E+6	ID
Aldicarb sulfoxide	1646873	4.0 (A)	4.0 (A)	NA	NLV	NLV	2.80E+7	ID
Aldrin	309002	0.098	0.4	0.01 (M); 8.7E-6	180 (S)	180 (S)	180	ID
Aluminum (B)	7429905	50 (V)	50 (V)	NA	NLV	NLV	NA	ID
Ammonia	7664417	10,000 (N)	10,000 (N)	(CC)	3.2E+6	7.1E+6	5.30E+8	ID
t-Amyl methyl ether (TAME)	994058	190 (E)	190 (E)	NA	2.6E+5	5.7E+5	2.64E+6	NA
Aniline	62533	53	220	4	NLV	NLV	3.60E+7	NA
Anthracene	120127	43 (S)	43 (S)	ID	43 (S)	43 (S)	43.4	ID
Antimony	7440360	6.0 (A)	6.0 (A)	130 (X)	NLV	NLV	NA	ID
Arsenic	7440382	10 (A)	10 (A)	10	NLV	NLV	NA	ID
Asbestos (BB)	1332214	7.0E MFL (A)	7.0E MFL (A)	NA	NLV	NLV	NA	NA
Atrazine	1912249	3.0 (A)	3.0 (A)	7.3	NLV	NLV	70,000	ID
Azobenzene	103333	23	94	ID	6,400 (S)	6,400 (S)	6,400	ID
Barium (B)	7440393	2,000 (A)	2,000 (A)	(G)	NLV	NLV	NA	ID

TABLE 1. GROUNDWATER: RESIDENTIAL AND NONRESIDENTIAL PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;

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criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (§324.20120a(10)). In these cases, 2 numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based or solubility value, whichever is lower.

Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	Water Solubility	Flammability and Explosivity Screening Level
Benzene (I)	71432	5.0 (A)	5.0 (A)	200 (X)	5,600	35,000	1.75E+6	68,000
Benzidine	92875	0.3 (M); 0.0037	0.3 (M); 0.015	0.3 (M); 0.073	NLV	NLV	5.20E+5	ID
Benzo(a)anthracene (Q)	56553	2.1	8.5	ID	NLV	NLV	9.4	ID
Benzo(b)fluoranthene (Q)	205992	1.5 (S,AA)	1.5 (S,AA)	ID	ID	ID	1.5	ID
Benzo(k)fluoranthene (Q)	207089	1.0 (M); 0.8 (S)	1.0 (M); 0.8 (S)	NA	NLV	NLV	0.8	ID
Benzo(g,h,i)perylene	191242	1.0 (M); 0.26 (S)	1.0 (M); 0.26 (S)	ID	NLV	NLV	0.26	ID
Benzo(a)pyrene (Q)	50328	5.0 (A)	5.0 (A)	ID	NLV	NLV	1.62	ID
Benzoic acid	65850	32,000	92,000	NA	NLV	NLV	3.50E+6	ID
Benzyl alcohol	100516	10,000	29,000	NA	NLV	NLV	4.40E+7	ID
Benzyl chloride	100447	7.7	32	NA	12,000	77,000	4.90E+5	NA
Beryllium	7440417	4.0 (A)	4.0 (A)	(G)	NLV	NLV	NA	ID
bis(2-Chloroethoxy)ethane	112265	ID	ID	ID	NLV	NLV	1.89E+7	ID
bis(2-Chloroethyl)ether (I)	111444	2	8.3	1.0 (M); 0.79	38,000	2.1E+5	1.72E+7	1.7E+7 (S)
bis(2-Ethylhexyl)phthalate	117817	6.0 (A)	6.0 (A)	25	NLV	NLV	340	NA
Boron (B)	7440428	500 (F)	500 (F)	7,200 (X)	NLV	NLV	NA	ID
Bromate	15541454	10 (A)	10 (A)	40 (X)	NLV	NLV	38,000	ID
Bromobenzene (I)	108861	18	50	NA	1.8E+5	3.9E+5	4.13E+5	ID
Bromodichloromethane	75274	80 (A,W)	80 (A,W)	ID	4,800	37,000	6.74E+6	ID
Bromoform	75252	80 (A,W)	80 (A,W)	ID	4.7E+5	3.1E+6 (S)	3.10E+6	ID

Bromomethane	74839	10	29	35	4,000	9,000	1.45E+7	ID
n-Butanol (I)	71363	950	2,700	9,800 (X)	NLV	NLV	7.40E+7	4.7E+7
2-Butanone (MEK) (I)	78933	13,000	38,000	2,200	2.4E+8 (S)	2.4E+8 (S)	2.40E+8	ID
n-Butyl acetate	123864	550	1,600	NA	6.7E+6 (S)	6.7E+6 (S)	6.70E+6	2.5E+6
t-Butyl alcohol	75650	3,900	11,000	NA	1.0E+9 (D,S)	1.0E+9 (D,S)	1.00E+9	6.1E+7
Butyl benzyl phthalate	85687	1,200	2,700 (S)	67 (X)	NLV	NLV	2,690	ID
n-Butylbenzene	104518	80	230	ID	ID	ID	NA	ID
sec-Butylbenzene	135988	80	230	ID	ID	ID	NA	ID
t-Butylbenzene (I)	98066	80	230	ID	ID	ID	NA	ID

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Cadmium (B)	7440439	5.0 (A)	5.0 (A)	(G,X)	NLV	NLV	NA	ID
Camphene (I)	79925	ID	ID	NA	440	1,000	33,400	ID
Caprolactam	105602	5,800	17,000	NA	NLV	NLV	5.25E+9	NA
Carbaryl	63252	700	2,000	NA	ID	ID	1.26E+5	ID
Carbazole	86748	85	350	10 (M); 4.0	NLV	NLV	7,480	ID
Carbofuran	1563662	40 (A)	40 (A)	NA	NLV	NLV	7.00E+5	ID
Carbon disulfide (I,R)	75150	800	2,300	ID	2.5E+5	5.5E+5	1.19E+6	13,000
Carbon tetrachloride	56235	5.0 (A)	5.0 (A)	45 (X)	370	2,400	7.93E+5	ID
Chlordane (J)	57749	2.0 (A)	2.0 (A)	2.0 (M); 0.00025	56 (S)	56 (S)	56	ID

Chloride	16887006	2.5E+5 (E)	2.5E+5 (E)	(FF)	NLV	NLV	NA	ID
Chlorobenzene (I)	108907	100 (A)	100 (A)	25	2.1E+5	4.7E+5 (S)	4.72E+5	1.6E+5
p-Chlorobenzene sulfonic acid	98668	7,300	21,000	ID	ID	ID	NA	ID
1-Chloro-1,1-difluoroethane	75683	15,000	44,000	NA	3.9E+6 (S)	3.9E+6 (S)	3.90E+6	NA
Chloroethane	75003	430	1,700	1,100 (X)	5.7E+6 (S)	5.7E+6 (S)	5.74E+6	1.1E+5
2-Chloroethyl vinyl ether	110758	ID	ID	NA	ID	ID	1.50E+7	ID
Chloroform	67663	80 (A,W)	80 (A,W)	350	28,000	1.8E+5	7.92E+6	ID
Chloromethane (I)	74873	260	1,100	ID	8,600	45,000	6.34E+6	36,000
4-Chloro-3-methylphenol	59507	150	420	7.4	NLV	NLV	3.90E+6	ID
beta-Chloronaphthalene	91587	1,800	5,200	NA	ID	ID	6,740	ID
2-Chlorophenol	95578	45	130	18	4.9E+5	1.1E+6	2.20E+7	ID
o-Chlorotoluene (I)	95498	150	420	ID	2.2E+5	3.7E+5 (S)	3.73E+5	ID
Chlorpyrifos	2921882	22	63	2.0 (M); 0.002	2.9	6.6	1,120	ID
Chromium (III) (B,H)	16065831	100 (A)	100 (A)	(G,X)	NLV	NLV	NA	ID
Chromium (VI)	18540299	100 (A)	100 (A)	11	NLV	NLV	NA	ID
Chrysene (Q)	218019	1.6 (S)	1.6 (S)	ID	ID	ID	1.6	ID
Cobalt	7440484	40	100	100	NLV	NLV	NA	ID
Copper (B)	7440508	1,000 (E)	1,000 (E)	(G)	NLV	NLV	NA	ID
Cyanazine	21725462	2.3	9.4	56 (X)	NLV	NLV	1.70E+5	ID

**TABLE 1. GROUNDWATER: RESIDENTIAL AND NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;**

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Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	Water Solubility	Flammability and Explosivity Screening Level
Cyanide (P,R)	57125	200 (A)	200 (A)	5.2	NLV	NLV	NA	ID
Cyclohexanone	108941	33,000	94,000	NA	1,500	3,300	2.30E+7	NA
Dacthal	1861321	73	210	NA	NLV	NLV	500	ID
Dalapon	75990	200 (A)	200 (A)	NA	NLV	NLV	5.02E+8	ID
4-4'-DDD	72548	9.1	37	NA	NLV	NLV	90	ID
4-4'-DDE	72559	4.3	15	NA	NLV	NLV	120	ID
4-4'-DDT	50293	3.6	10	0.02 (M); 1.1E-5	NLV	NLV	25	NA
Decabromodiphenyl ether	1163195	30 (S)	30 (S)	NA	30 (S)	30 (S)	30	ID
Di-n-butyl phthalate	84742	880	2,500	9.7	NLV	NLV	11,200	NA
Di(2-ethylhexyl) adipate	103231	400 (A)	400 (A)	ID	NLV	NLV	471	ID
Di-n-octyl phthalate	117840	130	380	ID	NLV	NLV	3,000	ID
Diacetone alcohol (I)	123422	ID	ID	NA	NLV	NLV	1.00E+9	1.0E+9 (S)
Diazinon	333415	1.3	3.8	1.0 (M); 0.004	NLV	NLV	68,800	NA
Dibenzo(a,h)anthracene (Q)	53703	2.0 (M); 0.21	2.0 (M); 0.85	ID	NLV	NLV	2.49	ID
Dibenzofuran	132649	ID	ID	4	10,000 (S)	10,000 (S)	10,000	ID
Dibromochloromethane	124481	80 (A,W)	80 (A,W)	ID	14,000	1.1E+5	2.60E+6	ID
Dibromochloropropane	96128	0.2 (A)	0.2 (A)	ID	220	1,200 (S)	1,230	NA
Dibromomethane	74953	80	230	NA	ID	ID	1.10E+7	ID
Dicamba	1918009	220	630	NA	NLV	NLV	4.50E+6	ID
1,2-Dichlorobenzene	95501	600 (A)	600 (A)	13	1.6E+5 (S)	1.6E+5 (S)	1.56E+5	NA
1,3-Dichlorobenzene	541731	6.6	19	28	18,000	41,000	1.11E+5	ID
1,4-Dichlorobenzene	106467	75 (A)	75 (A)	17	16,000	74,000 (S)	73,800	NA
3,3'-Dichlorobenzidine	91941	1.1	4.3	0.3 (M); 0.2	NLV	NLV	3,110	ID
Dichlorodifluoromethane	75718	1,700	4,800	ID	2.2E+5	3.0E+5 (S)	3.00E+5	ID
1,1-Dichloroethane	75343	880	2,500	740	1.0E+6	2.3E+6	5.06E+6	3.8E+5

1,2-Dichloroethane (I)	107062	5.0 (A)	5.0 (A)	360 (X)	9,600	59,000	8.52E+6	2.5E+6
1,1-Dichloroethylene (I)	75354	7.0 (A)	7.0 (A)	130	200	1,300	2.25E+6	97,000
cis-1,2-Dichloroethylene	156592	70 (A)	70 (A)	620	93,000	2.1E+5	3.50E+6	5.3E+5

**TABLE 1. GROUNDWATER: RESIDENTIAL AND NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;**

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Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	Water Solubility	Flammability and Explosivity Screening Level
trans-1,2-Dichloroethylene	156605	100 (A)	100 (A)	1,500 (X)	85,000	2.0E+5	6.30E+6	2.3E+5
2,6-Dichloro-4-nitroaniline	99309	2,200	6,300	NA	NLV	NLV	7,000	ID
2,4-Dichlorophenol	120832	73	210	11	NLV	NLV	4.50E+6	ID
2,4-Dichlorophenoxyacetic acid	94757	70 (A)	70 (A)	220	NLV	NLV	6.80E+5	ID
1,2-Dichloropropane (I)	78875	5.0 (A)	5.0 (A)	230 (X)	16,000	36,000	2.80E+6	5.5E+5
1,3-Dichloropropene	542756	8.5	35	9.0 (X)	3,900	26,000	2.80E+6	1.3E+5
Dichlorovos	62737	1.6	6.7	NA	NLV	NLV	1.60E+7	NA
Dicyclohexyl phthalate	84617	ID	ID	NA	ID	ID	4,000	ID
Dieldrin	60571	0.11	0.43	0.02 (M); 6.5E-6	200 (S)	200 (S)	195	ID
Diethyl ether	60297	10 (E)	10 (E)	ID	6.1E+7 (S)	6.1E+7 (S)	6.10E+7	6.5E+5
Diethyl phthalate	84662	5,500	16,000	110	NLV	NLV	1.08E+6	NA

Diethylene glycol monobutyl ether	112345	88	250	NA	NLV	NLV	1.00E+9	ID
Diisopropyl ether	108203	30	86	ID	8,000 (S)	8,000 (S)	8,041	8,000 (S)
Diisopropylamine (I)	108189	5.6	16	NA	2.1E+7	3.7E+7 (S)	3.69E+7	4.6E+6
Dimethyl phthalate	131113	73,000	2.10E+05	NA	NLV	NLV	4.19E+6	NA
N,N-Dimethylacetamide	127195	180	520	4,100 (X)	NLV	NLV	1.00E+9	NA
N,N-Dimethylaniline	121697	16	46	NA	2.4E+5	1.3E+6 (S)	1.27E+6	NA
Dimethylformamide (I)	68122	700	2,000	NA	NLV	NLV	1.00E+9	ID
2,4-Dimethylphenol	105679	370	1,000	380	NLV	NLV	7.87E+6	ID
2,6-Dimethylphenol	576261	4.4	13	NA	NLV	NLV	6.14E+6	ID
3,4-Dimethylphenol	95658	10	29	25	NLV	NLV	4.93E+6	ID
Dimethylsulfoxide	67685	2.2E+5	6.3E+5	1.9E+5	NLV	NLV	1.66E+8	ID
2,4-Dinitrotoluene	121142	7.7	32	NA	NLV	NLV	2.70E+5	ID
Dinoseb	88857	7.0 (A)	7.0 (A)	1.0 (M); 0.48	NLV	NLV	52,000	ID
1,4-Dioxane (I)	123911	85	350	2,800 (X)	NLV	NLV	9.00E+8	1.4E+8
Diquat	85007	20 (A)	20 (A)	20 (M); 6.0	NLV	NLV	7.00E+5	ID
Dissolved oxygen (DO)	NA	ID	ID	(EE)	ID	ID	NA	NA
Diuron	330541	31	90	NA	NLV	NLV	37,300	ID

**TABLE 1. GROUNDWATER: RESIDENTIAL AND NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;**

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Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Residential Groundwater Volatilization to Indoor Air Inhalation	Nonresidential Groundwater Volatilization to Indoor Air Inhalation	Water Solubility	Flammability and Explosivity Screening Level
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					Criteria	Criteria		
Endosulfan (J)	115297	44	130	0.03 (M); 0.029	ID	ID	510	ID
Endothall	145733	100 (A)	100 (A)	NA	NLV	NLV	1.00E+8	ID
Endrin	72208	2.0 (A)	2.0 (A)	ID	NLV	NLV	250	ID
Epichlorohydrin (I)	106898	5.0 (M); 2.0 (A)	5.0 (M); 2.0 (A)	NA	3.2E+5	6.3E+5	6.60E+7	4.7E+7
Ethanol (I)	64175	1.9E+6	3.8E+6	ID	NLV	NLV	1.00E+9	9.7E+7
Ethyl acetate (I)	141786	6,600	19,000	NA	6.4E+7 (S)	6.4E+7 (S)	6.40E+7	4.2E+6
Ethyl-tert-butyl ether (ETBE)	637923	49 (E)	49 (E)	ID	2.9E+6	5.6E+6 (S)	5.63E+6	ID
Ethylbenzene (I)	100414	74 (E)	74 (E)	18	1.1E+5	1.7E+5 (S)	1.69E+5	43,000
Ethylene dibromide	106934	0.05 (A)	0.05 (A)	5.7 (X)	2,400	15,000	4.20E+6	ID
Ethylene glycol	107211	15,000	42,000	1.9E+5 (X)	NLV	NLV	1.00E+9	NA
Ethylene glycol monobutyl ether	111762	3,700	10,000	NA	2.9E+6	6.5E+6	2.24E+8	NA
Fluoranthene	206440	210 (S)	210 (S)	1.6	210 (S)	210 (S)	206	ID
Fluorene	86737	880	2,000 (S)	12	2,000 (S)	2,000 (S)	1,980	ID
Fluorine (soluble fluoride) (B)	7782414	2,000 (E)	2,000 (E)	ID	NLV	NLV	NA	ID
Formaldehyde	50000	1,300	3,800	120	63,000	3.6E+5	5.50E+8	ID
Formic acid (I,U)	64186	10,000	29,000	ID	7.7E+6	1.5E+7	1.00E+9	1.0E+9 (D)
1-Formylpiperidine	2591868	80	230	NA	ID	ID	NA	ID
Gentian violet	548629	15	63	NA	NLV	NLV	1.00E+6	ID
Glyphosate	1071836	700 (A)	700 (A)	NA	NLV	NLV	1.16E+7	ID
Heptachlor	76448	0.4 (A)	0.4 (A)	0.01 (M); 0.0018	180 (S)	180 (S)	180	ID
Heptachlor epoxide	1024573	0.2 (A)	0.2 (A)	ID	NLV	NLV	200	ID
n-Heptane	142825	2,700 (S)	2,700 (S)	NA	2,700 (S)	2,700 (S)	2,690	200
Hexabromobenzene	87821	0.17 (S); 20	0.17 (S); 58	ID	ID	ID	0.17	ID
Hexachlorobenzene (C-66)	118741	1.0 (A)	1.0 (A)	0.2 (M); 0.0003	440	3,000	6,200	ID
Hexachlorobutadiene (C- 46)	87683	15	42	0.053	1,600	3,200 (S)	3,230	ID
alpha-	319846	0.43	1.7	ID	2,000 (S)	2,000 (S)	2,000	ID

Hexachlorocyclohexane								
beta-Hexachlorocyclohexane	319857	0.88	3.6	ID	NLV	NLV	240	ID
Hexachlorocyclopentadiene (C-56)	77474	50 (A)	50 (A)	ID	130	420	1,800	ID

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Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	Water Solubility	Flammability and Explosivity Screening Level
Hexachloroethane	67721	7.3	21	6.7 (X)	27,000	50,000 (S)	50,000	ID
n-Hexane	110543	3,000	8,600	NA	12,000 (S)	12,000 (S)	12,000	12,000 (S)
2-Hexanone	591786	1,000	2,900	ID	4.2E+6	8.7E+6	1.60E+7	NA
Indeno(1,2,3-cd)pyrene (Q)	193395	2.0 (M); 0.022 (S)	2.0 (M); 0.022 (S)	ID	NLV	NLV	0.022	ID
Iron (B)	7439896	300 (E)	300 (E)	NA	NLV	NLV	NA	ID
Isobutyl alcohol (I)	78831	2,300	6,700	NA	7.6E+7 (S)	7.6E+7 (S)	7.60E+7	ID
Isophorone	78591	770	3,100	1,300 (X)	NLV	NLV	1.20E+7	ID
Isopropyl alcohol (I)	67630	470	1,300	57,000 (X)	NLV	NLV	1.00E+9	6.0E+7
Isopropyl benzene	98828	800	2,300	28	56,000 (S)	56,000 (S)	56,000	29,000
Lead (B)	7439921	4.0 (L)	4.0 (L)	(G,X)	NLV	NLV	NA	ID
Lindane	58899	0.2 (A)	0.2 (A)	0.03 (M); 0.026	ID	ID	6,800	ID
Lithium (B)	7439932	170	350	440	NLV	NLV	NA	ID
Magnesium (B)	7439954	4.0E+5	1.1E+6	NA	NLV	NLV	NA	ID

Manganese (B)	7439965	50 (E)	50 (E)	(G,X)	NLV	NLV	NA	ID
Mercury (Total) (B,Z)	Varies	2.0 (A)	2.0 (A)	0.0013	56 (S)	56 (S)	56	ID
Methane	74828	ID	ID	NA	(K)	(K)	NA	(AA)
Methanol	67561	3,700	10,000	5.9E+5 (X)	2.9E+7 (S)	2.9E+7 (S)	2.90E+7	4.5E+6
Methoxychlor	72435	40 (A)	40 (A)	NA	ID	ID	45	ID
2-Methoxyethanol (I)	109864	7.3	21	NA	NLV	NLV	1.00E+9	ID
2-Methyl-4- chlorophenoxyaceti c acid	94746	7.3	21	NA	NLV	NLV	9.24E+5	ID
2-Methyl-4,6- dinitrophenol	534521	20 (M); 2.6	20 (M); 7.3	NA	NLV	NLV	2.00E+5	ID
N-Methyl- morpholine (I)	109024	20	56	NA	NLV	NLV	1.00E+9	ID
Methyl parathion	298000	1.8	5.2	NA	NLV	NLV	50,000	ID
4-Methyl-2- pentanone (MIBK) (I)	108101	1,800	5,200	ID	2.0E+7 (S)	2.0E+7 (S)	2.00E+7	ID
Methyl-tert-butyl ether (MTBE)	1634044	40 (E)	40 (E)	7,100 (X)	4.7E+7 (S)	4.7E+7 (S)	4.68E+7	ID
Methylcyclopentane (I)	96377	ID	ID	NA	22,000	49,000	73,890	ID
4,4'-Methylene-bis- 2- chloroaniline	101144	1.1	4.5	NA	NLV	NLV	14,000	ID
Methylene chloride	75092	5.0 (A)	5.0 (A)	1,500 (X)	2.2E+5	1.4E+6	1.70E+7	ID

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Hazardous Substance	Chemical	Residentia	Nonresidentia	Groundwater	Residential	Nonresidentia	Water	Flammability
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	Abstract Service Number	I Drinking Water Criteria	I Drinking Water Criteria	Surface Water Interface Criteria	Groundwater Volatilization to Indoor Air Inhalation Criteria	I Groundwater Volatilization to Indoor Air Inhalation Criteria	Solubility	and Explosivity Screening Level
2-Methylnaphthalene	91576	260	750	19	25,000 (S)	25,000 (S)	24,600	ID
Methylphenols (J)	1319773	370	1,000	30 (M); 25	NLV	NLV	2.80E+7	NA
Metolachlor	51218452	240	990	15	NLV	NLV	5.30E+5	ID
Metribuzin	21087649	180	520	NA	ID	ID	1.20E+6	ID
Mirex	2385855	0.02 (M); 6.8E-6 (S)	0.02 (M); 6.8E-6 (S)	0.02 (M); 6.8E-6 (S)	ID	ID	6.80E-6	NA
Molybdenum (B)	7439987	73	210	3,200 (X)	NLV	NLV	NA	ID
Naphthalene	91203	520	1,500	11	31,000 (S)	31,000 (S)	31,000	NA
Nickel (B)	7440020	100 (A)	100 (A)	(G)	NLV	NLV	NA	ID
Nitrate (B,N)	14797558	10,000 (A,N)	10,000 (A,N)	ID	NLV	NLV	NA	ID
Nitrite (B,N)	14797650	1,000 (A,N)	1,000 (A,N)	NA	NLV	NLV	NA	ID
Nitrobenzene (I)	98953	3.4	9.6	180 (X)	2.8E+5	5.5E+5	2.09E+6	NA
2-Nitrophenol	88755	20	58	ID	NLV	NLV	2.50E+6	ID
n-Nitroso-di-n-propylamine	621647	5.0 (M); 0.19	5.0 (M); 0.77	NA	NLV	NLV	9.89E+6	ID
N-Nitrosodiphenylamine	86306	270	1,100	NA	NLV	NLV	35,100	ID
Oxamyl	23135220	200 (A)	200 (A)	NA	NLV	NLV	2.80E+8	ID
Oxo-hexyl acetate	88230357	73	210	NA	ID	ID	NA	ID
Pendimethalin	40487421	280 (S)	280 (S)	NA	NLV	NLV	275	ID
Pentachlorobenzene	608935	6.1	17	5.0 (M); 0.019	ID	ID	650	ID
Pentachloronitrobenzene	82688	32 (S)	32 (S)	NA	32 (S)	32 (S)	32	ID
Pentachlorophenol	87865	1.0 (A)	1.0 (A)	(G,X)	NLV	NLV	1.85E+6	ID
Pentane	109660	ID	ID	NA	38,000 (S)	38,000 (S)	38,200	340
2-Pentene (I)	109682	ID	ID	NA	ID	ID	2.03E+5	ID
pH	NA	6.5 to 8.5 (E)	6.5 to 8.5 (E)	6.5 to 9.0	ID	ID	NA	NA

Phenanthrene	85018	52	150	2.0 (M); 1.4	1,000 (S)	1,000 (S)	1,000	ID
Phenol	108952	4,400	13,000	450	NLV	NLV	8.28E+7	NA
Phenytion	57410	17	68	89 (X)	NLV	NLV	32,000	ID
Phosphorus (Total)	7723140	63,000	2.40E+05	(EE)	NLV	NLV	NA	ID
Phthalic acid	88993	14,000	40,000	NA	NLV	NLV	1.42E+7	ID

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Phthalic anhydride	85449	15,000	44,000	NA	NLV	NLV	6.20E+6	NA
Picloram	1918021	500 (A)	500 (A)	46	NLV	NLV	4.30E+5	ID
Piperidine	110894	3.2	9.2	NA	NLV	NLV	1.00E+9	ID
Polybrominated biphenyls (J)	67774327	0.03	0.09	ID	NLV	NLV	1.66E+7	ID
Polychlorinated biphenyls (PCBs) (J,T)	1336363	0.5 (A)	0.5 (A)	0.2 (M); 2.6E-5	45 (S)	45 (S)	44.7	ID
Prometon	1610180	160	460	NA	NLV	NLV	7.50E+5	ID
Propachlor	1918167	95	270	NA	NLV	NLV	6.55E+5	ID
Propazine	139402	200	560	NA	NLV	NLV	8,600	ID
Propionic acid	79094	12,000	35,000	ID	NLV	NLV	1.00E+9	1.0E+9 (D)
Propyl alcohol (I)	71238	1,400	4,000	NA	NLV	NLV	1.00E+9	7.1E+7
n-Propylbenzene (I)	103651	80	230	ID	ID	ID	NA	ID
Propylene glycol	57556	1.5E+5	4.2E+5	2.9E+5	NLV	NLV	1.00E+9	ID

Pyrene	129000	140 (S)	140 (S)	ID	140 (S)	140 (S)	135	ID
Pyridine (I)	110861	20 (M); 7.3	21	NA	5,500	12,000	3.00E+5	81,000
Selenium (B)	7782492	50 (A)	50 (A)	5	NLV	NLV	NA	ID
Silver (B)	7440224	34	98	0.2 (M); 0.06	NLV	NLV	NA	ID
Silvex (2,4,5-TP)	93721	50 (A)	50 (A)	30	NLV	NLV	1.40E+5	ID
Simazine	122349	4.0 (A)	4.0 (A)	17	NLV	NLV	4,470	ID
Sodium	17341252	2.3E+S(HH)	3.5E+5	NA	NLV	NLV	NA	ID
Sodium azide	26628228	88	250	50 (M); 7.3	ID	ID	NA	ID
Strontium (B)	7440246	4,600	13,000	21,000	NLV	NLV	NA	ID
Styrene	100425	100 (A)	100 (A)	80 (X)	1.7E+5	3.1E+5 (S)	3.10E+5	1.4E+5
Sulfate	14808798	2.5E+5 (E)	2.5E+5 (E)	NA	NLV	NLV	NA	ID
Tebuthiuron	34014181	510	1,500	NA	NLV	NLV	2.50E+6	ID
2,3,7,8-Tetrabromodibenzo-p-dioxin (O)	50585416	(O)	(O)	(O)	NLV	NLV	0.00996	ID
1,2,4,5-Tetrachlorobenzene	95943	1,300 (S)	1,300 (S)	2.9 (X)	1,300 (S)	1,300 (S)	1,300	ID
2,3,7,8-Tetrachlorodibenzo-p-dioxin (O)	1746016	3.0E-5 (A)	3.0E-5 (A)	1.0E-5 (M); 3.1E-9	NLV	NLV	0.019	ID
1,1,1,2-Tetrachloroethane	630206	77	320	ID	15,000	96,000	1.10E+6	ID

**TABLE 1. GROUNDWATER: RESIDENTIAL AND NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;**

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to 1 microgram per liter (ug/L). Criteria with 6 or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (§324.20120a(10)). In these cases, 2 numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based or solubility value, whichever is lower.

Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface	Residential Groundwater Volatilization to Indoor Air	Nonresidential Groundwater Volatilization to Indoor Air	Water Solubility	Flammability and Explosivity Screening Level
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				Criteria	Inhalation Criteria	Inhalation Criteria		
1,1,2,2-Tetrachloroethane	79345	8.5	35	78 (X)	12,000	77,000	2.97E+6	ID
Tetrachloroethylene	127184	5.0 (A)	5.0 (A)	60 (X)	25,000	1.7E+5	2.00E+5	ID
Tetrahydrofuran	109999	95	270	11,000 (X)	6.9E+6	1.6E+7	1.00E+9	60,000
Tetranitromethane	509148	ID	ID	NA	580	3,200	85,000	ID
Thallium (B)	7440280	2.0 (A)	2.0 (A)	3.7 (X)	NLV	NLV	NA	ID
Toluene (I)	108883	790 (E)	790 (E)	270	5.3E+5 (S)	5.3E+5 (S)	5.26E+5	61,000
p-Toluidine	106490	15	62	NA	NLV	NLV	7.60E+6	NA
Total dissolved solids (TDS)	NA	5.0E+5 (E)	5.0E+5 (E)	(EE)	ID	ID	NA	NA
Toxaphene	8001352	3.0 (A)	3.0 (A)	1.0 (M); 6.8E-5	NLV	NLV	740	ID
Triallate	2303175	95	270	NA	ID	ID	4,000	ID
Tributylamine	102829	10	29	ID	14,000	32,000	75,400	ID
1,2,4-Trichlorobenzene	120821	70 (A)	70 (A)	99 (X)	3.0E+5 (S)	3.0E+5 (S)	3.00E+5	NA
1,1,1-Trichloroethane	71556	200 (A)	200 (A)	89	6.6E+5	1.3E+6 (S)	1.33E+6	ID
1,1,2-Trichloroethane	79005	5.0 (A)	5.0 (A)	330 (X)	17,000	1.1E+5	4.42E+6	NA
Trichloroethylene	79016	5.0 (A)	5.0 (A)	200 (X)	2,200	4,900	1.10E+6	ID
Trichlorofluoromethane	75694	2,600	7,300	NA	1.1E+6 (S)	1.1E+6 (S)	1.10E+6	ID
2,4,5-Trichlorophenol	95954	730	2,100	NA	NLV	NLV	1.20E+6	ID
2,4,6-Trichlorophenol	88062	120	470	5	NLV	NLV	8.00E+5	ID
1,2,3-Trichloropropane	96184	42	120	NA	8,300	18,000	1.90E+6	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	76131	1.7E+5 (S)	1.7E+5 (S)	32	1.7E+5 (S)	1.7E+5 (S)	1.70E+5	ID
Triethanolamine	102716	3,700	10,000	NA	NLV	NLV	1.00E+9	ID
Triethylene glycol	112276	4,300	12,000	NA	NLV	NLV	1.00E+6	ID
3-Trifluoromethyl-4-nitrophenol	88302	4,500	13,000	NA	NLV	NLV	5.00E+6	ID
Trifluralin	1582098	37	110	NA	ID	ID	8,100	ID
2,2,4-Trimethylpentane	540841	ID	ID	NA	2,300 (S)	2,300 (S)	2,330	160
2,4,4-Trimethyl-2-pentene (I)	107404	ID	ID	NA	ID	ID	11,900	ID

1,2,4-Trimethylbenzene (I)	95636	63 (E)	63 (E)	17	56,000 (S)	56,000 (S)	55,890	56,000 (S)
1,3,5-Trimethylbenzene (I)	108678	72 (E)	72 (E)	45	61,000 (S)	61,000 (S)	61,150	ID

**TABLE 1. GROUNDWATER: RESIDENTIAL AND NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;**

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to 1 microgram per liter (ug/L). Criteria with 6 or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (§324.20120a(10)). In these cases, 2 numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based or solubility value, whichever is lower.

Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	Water Solubility	Flammability and Explosivity Screening Level
Triphenyl phosphate	115866	1,200	1,400 (S)	NA	NLV	NLV	1,430	ID
tris(2,3-Dibromopropyl)phosphate	126727	10 (M); 0.71	10 (M); 2.9	ID	4,700 (S)	4,700 (S)	4,700	ID
Urea	57136	ID	ID	NA	NLV	NLV	NA	ID
Vanadium	7440622	4.5	62	27	NLV	NLV	NA	ID
Vinyl acetate (I)	108054	640	1,800	NA	4.1E+6	8.9E+6	2.00E+7	1.8E+6
Vinyl chloride	75014	2.0 (A)	2.0 (A)	13 (X)	1,100	13,000	2.76E+6	33,000
White phosphorus (R)	12185103	0.11	0.31	NA	NLV	NLV	NA	ID
Xylenes (I)	1330207	280 (E)	280 (E)	41	1.9E+5 (S)	1.9E+5 (S)	1.86E+5	70,000
Zinc (B)	7440666	2,400	5,000 (E)	(G)	NLV	NLV	NA	ID

R 299.46 Generic soil cleanup criteria for residential category.

Rule 46 The generic soil cleanup criteria for residential category shall be as shown in table 2.

**TABLE 2. SOIL: RESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS**

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to 1 microgram per kilogram (ug/kg). Criteria with 6 or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (§324.20120a(10)). In these cases, 2 numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value.

Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Level	Groundwater Protection		Indoor Air	Ambient Air (Y) (C)				Contact	Csat
			Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Direct Contact Criteria	Soil Saturation Concentration Screening Levels
Barium (B)	7440393	75,000	1.3E+6	(G)	NLV	NLV	NLV	NLV	3.3E+8	3.7E+7	NA
Benzene (I)	71432	NA	100	4,000 (X)	1,600	13,000	34,000	79,000	3.8E+8	1.8E+5	4.0E+5
Benzidine	92875	NA	1,000 (M); 6.0	1,000 (M); 6.0	NLV	NLV	NLV	NLV	46,000	1,000 (M); 23	NA
Benzo(a)anthracene (Q)	56553	NA	NLL	NLL	NLV	NLV	NLV	NLV	ID	20,000	NA
Benzo(b)fluoranthene (Q)	205992	NA	NLL	NLL	ID	ID	ID	ID	ID	20,000	NA
Benzo(k)fluoranthene (Q)	207089	NA	NLL	NLL	NLV	NLV	NLV	NLV	ID	2.0E+5	NA
Benzo(g,h,i)perylene	191242	NA	NLL	NLL	NLV	NLV	NLV	NLV	8.0E+8	2.5E+6	NA
Benzo(a)pyrene (Q)	50328	NA	NLL	NLL	NLV	NLV	NLV	NLV	1.5E+6	2,000	NA
Benzoic acid	65850	NA	6.4E+5	NA	NLV	NLV	NLV	NLV	ID	9.9E+8	NA
Benzyl alcohol	100516	NA	2.0E+5	NA	NLV	NLV	NLV	NLV	3.3E+11	3.2E+8 (C)	5.8E+6
Benzyl chloride	100447	NA	150	NA	6,300	14,000	14,000	17,000	6.2E+7	48,000	2.3E+5
Beryllium	7440417	NA	51,000	(G)	NLV	NLV	NLV	NLV	1.3E+6	4.1E+5	NA
bis(2-Chloroethoxy)ethane	112265	NA	ID	ID	NLV	NLV	NLV	NLV	ID	ID	2.7E+6
bis(2-Chloroethyl)ether (I)	111444	NA	100	100 (M); 20	8,300	3,800	3,800	3,800	9.4E+6	13,000	2.2E+6
bis(2-Ethylhexyl)phthalate	117817	NA	NLL	NLL	NLV	NLV	NLV	NLV	7.0E+8	2.8E+6	1.0E+7
Boron (B)	7440428	NA	10,000	1.4E+5 (X)	NLV	NLV	NLV	NLV	ID	4.8E+7 (DD)	NA
Bromate	15541454	NA	200	800 (X)	NLV	NLV	NLV	NLV	ID	17,000	NA
Bromobenzene (I)	108861	NA	550	NA	3.1E+5	4.5E+5	4.5E+5	4.5E+5	5.3E+8	5.4E+5	7.6E+5
Bromodichloromethane	75274	NA	1,600 (W)	ID	1,200	9,100	9,700	19,000	8.4E+7	1.1E+5	1.5E+6
Bromoform	75252	NA	1,600 (W)	ID	1.5E+5	9.0E+5	9.0E+5	9.0E+5	2.8E+9	8.2E+5	8.7E+5
Bromomethane	74839	NA	200	700	860	11,000	57,000	1.4E+5	3.3E+8	3.2E+5	2.2E+6
n-Butanol (I)	71363	NA	19,000	2.0E+5	NLV	NLV	NLV	NLV	2.3E+10	2.9E+7 (C)	8.7E+6
2-Butanone (MEK) (I)	78933	NA	2.6E+5	44,000	5.4E+7 (C)	2.9E+7	2.9E+7	3.5E+7	6.7E+10	1.2E+8 (C, DD)	2.7E+7
n-Butyl acetate	123864	NA	11,000	NA	5.6E+7 (C)	1.1E+8	2.6E+8	3.2E+8	4.7E+11	1.7E+7 (C)	1.1E+6
t-Butyl alcohol	75650	NA	78,000	NA	3.1E+8 (C)	9.7E+7	2.0E+8	2.0E+8	1.3E+11	1.2E+8 (C)	1.1E+8
Butyl benzyl phthalate	85687	NA	2.2E+6 (C)	1.2E+5 (X)	NLV	NLV	NLV	NLV	4.7E+10	3.6E+7 (C)	3.1E+5
n-Butylbenzene	104518	NA	1,600	ID	ID	ID	ID	ID	2.0E+9	2.5E+6	1.0E+7

TABLE 2. SOIL: RESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to 1 microgram per kilogram (ug/kg). Criteria with 6 or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (§324.20120a(10)). In these cases, 2 numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value.

Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Level	Groundwater Protection		Indoor Air	Ambient Air (Y) (C)				Contact	Csat
			Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Direct Contact Criteria	Soil Saturation Concentration Screening Levels
sec-Butylbenzene	135988	NA	1,600	ID	ID	ID	ID	ID	4.0E+8	2.5E+6	1.0E+7
t-Butylbenzene (I)	98066	NA	1,600	ID	ID	ID	ID	ID	6.7E+8	2.5E+6	1.0E+7
Cadmium (B)	7440439	1,200	6,000	(G,X)	NLV	NLV	NLV	NLV	1.7E+6	5.5E+5	NA
Camphene (I)	79925	NA	ID	NA	3,700	1.5E+5	9.1E+5	2.2E+6	5.3E+9	ID	NA
Caprolactam	105602	NA	1.2E+5	NA	NLV	NLV	NLV	NLV	6.7E+8	5.3E+7 (DD)	NA
Carbaryl	63252	NA	14,000	NA	ID	ID	ID	ID	ID	2.2E+7	NA
Carbazole	86748	NA	9,400	1,100	NLV	NLV	NLV	NLV	6.2E+7	5.3E+5	NA
Carbofuran	1563662	NA	800	NA	NLV	NLV	NLV	NLV	ID	1.1E+6	NA
Carbon disulfide (I,R)	75150	NA	16,000	ID	76,000	1.3E+6	7.9E+6	1.9E+7	4.7E+10	7.2E+6 (C, DD)	2.8E+5
Carbon tetrachloride	56235	NA	100	900 (X)	190	3,500	12,000	28,000	1.3E+8	96,000	3.9E+5
Chlordane (J)	57749	NA	NLL	NLL	1.1E+7	1.2E+6	1.2E+6	1.2E+6	3.1E+7	31,000	NA
Chloride	16887006	NA	5.0E+6	(X)	NLV	NLV	NLV	NLV	ID	5.0E+5 (F)	NA
Chlorobenzene (I)	108907	NA	2,000	500	1.2E+5	7.7E+5	9.9E+5	2.1E+6	4.7E+9	4.3E+6 (C)	2.6E+5
p-Chlorobenzene sulfonic acid	98668	NA	1.5E+5	ID	ID	ID	ID	ID	ID	2.3E+8	ID
1-Chloro-1,1-difluoroethane	75683	NA	3.0E+5	NA	2.9E+6 (C)	7.9E+7	5.6E+8	1.4E+9	3.3E+12	4.7E+8 (C)	9.6E+5
Chloroethane	75003	NA	8,600	22,000 (X)	2.9E+6 (C)	3.00E+07	1.2E+8	2.8E+8	6.7E+11	2.6E+6 (C)	9.5E+5
2-Chloroethyl vinyl ether	110758	NA	ID	NA	ID	ID	ID	ID	ID	ID	1.9E+6
Chloroform	67663	NA	1,600 (W)	7,000	7,200	45,000	1.2E+5	2.7E+5	1.3E+9	1.2E+6	1.5E+6
Chloromethane (I)	74873	NA	5,200	ID	2,300	40,000	4.1E+5	1.0E+6	4.9E+9	1.6E+6 (C)	1.1E+6
4-Chloro-3-methylphenol	59507	NA	5,800	280	NLV	NLV	NLV	NLV	ID	4.5E+6	NA
beta-Chloronaphthalene	91587	NA	6.2E+5	NA	ID	ID	ID	ID	ID	5.6E+7	NA
2-Chlorophenol	95578	NA	900	360	4.3E+5	9.6E+5	9.6E+5	9.6E+5	1.2E+9	1.4E+6	1.9E+7
o-Chlorotoluene (I)	95498	NA	3,300	ID	2.7E+5	1.2E+6	2.9E+6	6.3E+6	4.7E+9	4.5E+6 (C)	5.0E+5

Chlorpyrifos	2921882	NA	17,000	1,500	130	4,600	23,000	55,000	1.3E+8	1.1E+7	NA
Chromium (III) (B,H)	16065831	18,000 (total)	1.0E+9 (D)	(G,X)	NLV	NLV	NLV	NLV	3.3E+8	7.9E+8	NA
Chromium (VI)	18540299	NA	30,000	3,300	NLV	NLV	NLV	NLV	2.6E+5	2.5E+6	NA
Chrysene (Q)	218019	NA	NLL	NLL	ID	ID	ID	ID	ID	2.0E+6	NA

TABLE 2. SOIL: RESIDENTIAL**PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS**

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			Groundwater Protection		Indoor Air	Ambient Air (Y) (C)				Contact	Csat
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Level	Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Direct Contact Criteria	Soil Saturation Concentration Screening Levels
Cobalt	7440484	6,800	800	2,000	NLV	NLV	NLV	NLV	1.3E+7	2.6E+6	NA
Copper (B)	7440508	32,000	5.8E+6	(G)	NLV	NLV	NLV	NLV	1.3E+8	2.0E+7	NA
Cyanazine	21725462	NA	200	1,100 (X)	NLV	NLV	NLV	NLV	ID	14,000	NA
Cyanide (P,R)	57125	390 (total)	4,000	100	NLV	NLV	NLV	NLV	2.5E+5	12,000	NA
Cyclohexanone	108941	NA	5.2E+6	NA	17,000	1.0E+6	1.1E+7	2.7E+7	6.7E+10	1.0E+9 (C,D)	2.2E+8
Dacthal	1861321	NA	50,000	NA	NLV	NLV	NLV	NLV	ID	2.3E+6	NA
Dalapon	75990	NA	4,000	NA	NLV	NLV	NLV	NLV	ID	1.9E+7	5.9E+7
4-4'-DDD	72548	NA	NLL	NLL	NLV	NLV	NLV	NLV	4.4E+7	95,000	NA
4-4'-DDE	72559	NA	NLL	NLL	NLV	NLV	NLV	NLV	3.2E+7	45,000	NA
4-4'-DDT	50293	NA	NLL	NLL	NLV	NLV	NLV	NLV	3.2E+7	57,000	NA
Decabromodiphenyl ether	1163195	NA	1.4E+5	NA	1.0E+9 (D)	8.6E+7	8.6E+7	8.6E+7	2.3E+9	3.8E+6	NA
Di-n-butyl phthalate	84742	NA	9.6E+5 (C)	11,000	NLV	NLV	NLV	NLV	3.3E+9	2.7E+7 (C)	7.6E+5
Di(2-ethylhexyl) adipate	103231	NA	1.3E+7 (C)	ID	NLV	NLV	NLV	NLV	9.2E+9	1.5E+7 (C, DD)	9.6E+5
Di-n-octyl phthalate	117840	NA	1.0E+8	ID	NLV	NLV	NLV	NLV	3.1E+10	6.9E+6	1.4E+8
Diacetone alcohol (I)	123422	NA	ID	NA	NLV	NLV	NLV	NLV	1.6E+11	ID	1.1E+8
Diazinon	333415	NA	95	72	NLV	NLV	NLV	NLV	ID	12,000 (DD)	3.1E+5
Dibenzo(a,h)anthracene (Q)	53703	NA	NLL	NLL	NLV	NLV	NLV	NLV	ID	2,000	NA
Dibenzofuran	132649	NA	ID	1,700	2.0E+6	1.3E+5	1.3E+5	1.3E+5	6.7E+6	ID	NA
Dibromochloromethane	124481	NA	1,600 (W)	ID	3,900	24,000	24,000	33,000	1.3E+8	1.1E+5	6.1E+5
Dibromochloropropane	96128	NA	10 (M); 4.0	ID	220	260	260	260	5.6E+5	4,400 (C)	1,200
Dibromomethane	74953	NA	1,600	NA	ID	ID	ID	ID	ID	2.5E+6 (C)	2.0E+6
Dicamba	1918009	NA	4,400	NA	NA	NLV	NLV	NLV	ID	3.4E+6	NA

1,2-Dichlorobenzene	95501	NA	14,000	280	1.1E+7 (C)	3.9E+7	3.9E+7	5.2E+7	1.0E+11	1.9E+7 (C)	2.1E+5
1,3-Dichlorobenzene	541731	NA	170	680	26,000	79,000	79,000	1.1E+5	2.0E+8	2.0E+5 (C)	1.7E+5
1,4-Dichlorobenzene	106467	NA	1,700	360	19,000	77,000	77,000	1.1E+5	4.5E+8	4.0E+5	NA
3,3'-Dichlorobenzidine	91941	NA	2,000 (M); 28	2,000 (M); 7.4	NLV	NLV	NLV	NLV	6.5E+6	6,600	NA
Dichlorodifluoromethane	75718	NA	95,000	ID	9.0E+5	5.3E+7	5.5E+8	1.4E+9	3.3E+12	5.2E+7 (C)	1.0E+6

**TABLE 2. SOIL: RESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS**

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1,1-Dichloroethane	75343	NA	18,000	15,000	2.3E+5	2.1E+6	5.9E+6	1.4E+7	3.3E+10	2.7E+7 (C)	8.9E+5
1,2-Dichloroethane (I)	107062	NA	100	7,200 (X)	2,100	6,200	11,000	26,000	1.2E+8	91,000	1.2E+6
1,1-Dichloroethylene (I)	75354	NA	140	2,600	62	1,100	5,300	13,000	6.2E+7	2.0E+5	5.7E+5
cis-1,2-Dichloroethylene	156592	NA	1,400	12,000	22,000	1.8E+5	4.2E+5	9.9E+5	2.3E+9	2.5E+6 (C)	6.4E+5
trans-1,2-Dichloroethylene	156605	NA	2,000	30,000 (X)	23,000	2.8E+5	8.3E+5	2.0E+6	4.7E+9	3.8E+6 (C)	1.4E+6
2,6-Dichloro-4-nitroaniline	99309	NA	44,000	NA	NLV	NLV	NLV	NLV	ID	6.8E+7	NA
2,4-Dichlorophenol	120832	NA	1,500	330 (M); 220	NLV	NLV	NLV	NLV	5.1E+9	6.6E+5 (DD)	1.8E+6
2,4-Dichlorophenoxy acetic acid	94757	NA	1,400	4,400	NLV	NLV	NLV	NLV	6.7E+9	2.5E+6	NA
1,2-Dichloropropane (I)	78875	NA	100	4,600 (X)	4,000	25,000	50,000	1.1E+5	2.7E+8	1.4E+5	5.5E+5
1,3-Dichloropropene	542756	NA	170	180 (X)	1,000	18,000	68,000	1.6E+5	7.8E+8	10,000	6.2E+5
Dichlorovos	62737	NA	50 (M); 32	NA	NLV	NLV	NLV	NLV	3.3E+7	10,000	2.2E+6
Dicyclohexyl phthalate	84617	NA	ID	NA	ID	ID	ID	ID	ID	ID	NA
Dieldrin	60571	NA	NLL	NLL	1.4E+5	19,000	19,000	19,000	6.8E+5	1,100	NA
Diethyl ether	60297	NA	200	ID	2.8E+7 (C)	8.5E+7	1.5E+8	3.4E+8	8.0E+11	1.1E+8 (C)	7.4E+6
Diethyl phthalate	84662	NA	1.1E+5	2,200	NLV	NLV	NLV	NLV	3.3E+9	1.7E+8 (C)	7.4E+5
Diethylene glycol monobutyl ether	112345	NA	1,800	NA	NLV	NLV	NLV	NLV	1.3E+9	2.7E+6	1.1E+8
Diisopropyl ether	108203	NA	600	ID	6.7E+5 (C)	3.4E+5	7.6E+5	1.8E+6	4.1E+9	9.2E+5 (C)	1,300
Diisopropylamine (I)	108189	NA	110	NA	5.5E+6	6.2E+6	6.2E+6	7.3E+6	1.3E+10	1.7E+5	6.7E+6
Dimethyl phthalate	131113	NA	1.5E+6 (C)	NA	NLV	NLV	NLV	NLV	3.3E+9	1.0E+9 (C,D)	7.9E+5

N,N-Dimethylacetamide	127195	NA	3,600	82,000 (X)	NLV	NLV	NLV	NLV	ID	5.6E+6	1.1E+8
N,N-Dimethylaniline	121697	NA	320	NA	1.7E+5	1.5E+5	1.5E+5	1.5E+5	2.6E+8	5.0E+5	8.0E+5
Dimethylformamide (I)	68122	NA	14,000	NA	NLV	NLV	NLV	NLV	2.0E+9	2.2E+7	1.1E+8
2,4-Dimethylphenol	105679	NA	7,400	7,600	NLV	NLV	NLV	NLV	4.7E+9	1.1E+7	NA
2,6-Dimethylphenol	576261	NA	330 (M); 88	NA	NLV	NLV	NLV	NLV	1.3E+8	1.4E+5	NA
3,4-Dimethylphenol	95658	NA	330 (M); 200	500	NLV	NLV	NLV	NLV	2.3E+8	3.2E+5	NA
Dimethylsulfoxide	67685	NA	4.4E+6	3.8E+6	NLV	NLV	NLV	NLV	1.3E+9	1.0E+9 (C,D)	1.8E+7
2,4-Dinitrotoluene	121142	NA	430	NA	NLV	NLV	NLV	NLV	1.6E+7	48,000	NA

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Dinoseb	88857	NA	300	200 (M); 43	NLV	NLV	NLV	NLV	2.7E+8	66,000 (DD)	1.4E+5
1,4-Dioxane (I)	123911	NA	1,700	56,000 (X)	NLV	NLV	NLV	NLV	5.7E+8	5.3E+5	9.7E+7
Diquat	85007	NA	400	400	NLV	NLV	NLV	NLV	ID	5.0E+5	NA
Diuron	330541	NA	620	NA	NLV	NLV	NLV	NLV	4.7E+8	9.7E+5	NA
Endosulfan (J)	115297	NA	NLL	NLL	ID	ID	ID	ID	ID	1.4E+6	NA
Endothall	145733	NA	NLL	NLL	NLV	NLV	NLV	NLV	2.3E+9	3.8E+6	NA
Endrin	72208	NA	NLL	NLL	NLV	NLV	NLV	NLV	ID	65,000	NA
Epichlorohydrin (I)	106898	NA	100	NA	64,000	31,000	31,000	35,000	6.7E+7	8,900	7.3E+6
Ethanol (I)	64175	NA	3.8E+7	ID	NLV	NLV	NLV	NLV	1.3E+12	1.0E+9 (C,D,DD)	1.1E+8
Ethyl acetate (I)	141786	NA	1.3E+5	NA	3.8E+7 (C)	4.9E+7	4.9E+7	9.8E+7	2.1E+11	2.0E+8 (C)	7.5E+6
Ethyl-tert-butyl ether (ETBE)	637923	NA	980	ID	5.4E+5	1.9E+6	4.5E+6	1.1E+7	2.5E+10	ID	6.5E+5
Ethylbenzene (I)	100414	NA	1,500	360	87,000	7.2E+5	1.0E+6	2.2E+6	1.0E+10	2.2E+7 (C)	1.4E+5
Ethylene dibromide	106934	NA	20 (M); 1.0	110 (X)	670	1,700	1,700	3,300	1.4E+7	92	8.9E+5
Ethylene glycol	107211	NA	3.0E+5	3.8E+6 (X)	NLV	NLV	NLV	NLV	6.7E+10	4.5E+8 (C)	1.1E+8
Ethylene glycol monobutyl ether	111762	NA	74,000	NA	7.4E+5	1.8E+7	1.5E+8	3.6E+8	8.7E+11	1.1E+8 (C)	4.1E+7
Fluoranthene	206440	NA	7.3E+5	5,500	1.0E+9 (D)	7.4E+8	7.4E+8	7.4E+8	9.3E+9	4.6E+7	NA
Fluorene	86737	NA	3.9E+5	5,300	5.8E+8	1.3E+8	1.3E+8	1.3E+8	9.3E+9	2.7E+7	NA
Fluorine (soluble fluoride)	7782414	NA	40,000	ID	NLV	NLV	NLV	NLV	ID	9.0E+6 (DD)	NA

(B)											
Formaldehyde	50000	NA	26,000	2,400	12,000	13,000	23,000	52,000	2.4E+8	4.1E+7	6.0E+7
Formic acid (L,U)	64186	NA	2.0E+5	ID	1.5E+6	2.1E+5	1.4E+5	1.4E+5	1.3E+8	3.2E+8 (C)	1.1E+8
1-Formylpiperidine	2591868	NA	1,600	NA	ID	ID	ID	ID	ID	2.5E+6	1.0E+7
Gentian violet	548629	NA	300	NA	NLV	NLV	NLV	NLV	ID	96,000	NA
Glyphosate	1071836	NA	NLL	NLL	NLV	NLV	NLV	NLV	ID	1.1E+7 (DD)	NA
Heptachlor	76448	NA	NLL	NLL	3.5E+5	62,000	62,000	62,000	2.4E+6	5,600	NA
Heptachlor epoxide	1024573	NA	NLL	NLL	NLV	NLV	NLV	NLV	1.2E+6	3,100	NA
n-Heptane	142825	NA	4.6E+7 (C)	NA	1.5E+6 (C)	2.1E+7	4.4E+7	1.0E+8	2.3E+11	9.9E+8 (C)	2.4E+5
Hexabromobenzene	87821	NA	5,400	ID	ID	ID	ID	ID	ID	1.1E+6	NA

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Hexachlorobenzene (C-66)	118741	NA	1,800	350	41,000	17,000	17,000	17,000	6.8E+6	8,900	NA
Hexachlorobutadiene (C-46)	87683	NA	26,000	91	1.3E+5	1.3E+5	1.3E+5	1.3E+5	1.4E+8	1.0E+5	3.5E+5
alpha-Hexachlorocyclohexane	319846	NA	18	ID	30,000	12,000	22,000	25,000	1.7E+6	2,600	NA
beta-Hexachlorocyclohexane	319857	NA	37	ID	NLV	NLV	NLV	NLV	5.9E+6	5,400	NA
Hexachlorocyclopentadiene (C-56)	77474	NA	3.2E+5	ID	30,000	50,000	50,000	50,000	1.3E+7	2.3E+6 (C)	7.2E+5
Hexachloroethane	67721	NA	430	1,800 (X)	40,000	5.5E+5	9.3E+5	9.3E+5	2.3E+8	2.3E+5	NA
n-Hexane	110543	NA	1.8E+5 (C)	NA	5.1E+5 (C)	3.0E+6	3.2E+6	6.2E+6	1.3E+10	9.2E+7 (C)	44,000
2-Hexanone	591786	NA	20,000	ID	9.9E+5	1.1E+6	1.1E+6	1.4E+6	2.7E+9	3.2E+7 (C)	2.5E+6
Indeno(1,2,3-cd) pyrene (Q)	193395	NA	NLL	NLL	NLV	NLV	NLV	NLV	ID	20,000	NA
Iron (B)	7439896	1.2E+7	6,000	NA	NLV	NLV	NLV	NLV	ID	1.6E+8	NA
Isobutyl alcohol (I)	78831	NA	46,000	NA	2.3E+8 (C)	7.9E+7	7.9E+7	7.9E+7	1.0E+11	7.2E+7 (C)	8.9E+6
Isophorone	78591	NA	15,000	26,000 (X)	NLV	NLV	NLV	NLV	1.2E+10	4.8E+6 (C)	2.4E+6
Isopropyl alcohol (I)	67630	NA	9,400	1.1E+6 (X)	NLV	NLV	NLV	NLV	1.5E+10	1.4E+7	1.1E+8
Isopropyl benzene	98828	NA	91,000	3,200	4.0E+5 (C)	1.7E+6	1.7E+6	2.8E+6	5.8E+9	2.5E+7 (C)	3.9E+5
Lead (B)	7439921	21,000	7.0E+5	(G,X)	NLV	NLV	NLV	NLV	1.0E+8	4.0E+5	NA

Lindane	58899	NA	20 (M); 7.0	20 (M); 1.1	ID	ID	ID	ID	ID	8,300	NA
Lithium (B)	7439932	9,800	3,400	8,800	NLV	NLV	NLV	NLV	2.3E+9	4.2E+6 (DD)	NA
Magnesium (B)	7439954	NA	8.0E+6	NA	NLV	NLV	NLV	NLV	6.7E+9	1.0E+9 (D)	NA
Manganese (B)	7439965	4.4E+5	1,000	(G,X)	NLV	NLV	NLV	NLV	3.3E+6	2.5E+7	NA
Mercury (Total) (B,Z)	Varies	130	1,700	50 (M); 1.2	48,000	52,000	52,000	52,000	2.0E+7	1.6E+5	NA
Methane	74828	NA	ID	NA	8.4E+6 ug/m3 (GG)	ID	ID	ID	ID	ID	ID
Methanol	67561	NA	74,000	1.2E+7 (C)	3.7E+7 (C)	3.1E+7	4.4E+7	9.6E+7	2.2E+11	1.1E+8 (C)	3.1E+6
Methoxychlor	72435	NA	16,000	NA	ID	ID	ID	ID	ID	1.9E+6	NA
2-Methoxyethanol (I)	109864	NA	150	NA	NLV	NLV	NLV	NLV	1.3E+9	2.3E+5	1.1E+8
2-Methyl-4-chlorophenoxyacetic acid	94746	NA	390	NA	NLV	NLV	NLV	NLV	ID	2.3E+5	NA
2-Methyl-4,6-dinitrophenol	534521	NA	830 (M); 400	NA	NLV	NLV	NLV	NLV	1.3E+8	79,000	NA
N-Methyl-morpholine (I)	109024	NA	400	NA	NLV	NLV	NLV	NLV	ID	6.1E+5	1.1E+8

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Methyl parathion	298000	NA	46	NA	NLV	NLV	NLV	NLV	ID	56,000	NA
4-Methyl-2-pentanone (MIBK) (I)	108101	NA	36,000	ID	3.7E+7 (C)	4.5E+7	4.5E+7	6.7E+7	1.4E+11	5.6E+7 (C)	2.7E+6
Methyl-tert-butyl ether (MTBE)	1634044	NA	800	1.4E+5 (X)	9.9E+6 (C)	2.5E+7	3.9E+7	8.7E+7	2.0E+11	1.5E+6	5.9E+6
Methyleyclopentane (I)	96377	NA	ID	NA	92,000	2.3E+6	8.2E+6	2.0E+7	4.7E+10	ID	3.5E+5
4,4'-Methylene-bis-2- chloroaniline (MBOCA)	101144	NA	NLL	NLL	NLV	NLV	NLV	NLV	8.4E+7	6,800	NA
Methylene chloride	75092	NA	100	30,000 (X)	45,000	2.1E+5	5.9E+5	1.4E+6	6.6E+9	1.3E+6	2.3E+6
2-Methylnaphthalene	91576	NA	57,000	4,200	2.7E+6	1.5E+6	1.5E+6	1.5E+6	6.7E+8	8.1E+6	NA
Methylphenols (J)	1319773	NA	7,400	1,000 (M); 600	NLV	NLV	NLV	NLV	6.7E+9	1.1E+7	NA
Metolachlor	51218452	NA	4,800	300	NLV	NLV	NLV	NLV	ID	1.5E+6 (C, DD)	4.4E+5
Metribuzin	21087649	NA	3,600	NA	ID	ID	ID	ID	ID	9.6E+6	NA
Mirex	2385855	NA	NLL	NLL	ID	ID	ID	ID	ID	9,600	NA
Molybdenum (B)	7439987	NA	1,500	64,000 (X)	NLV	NLV	NLV	NLV	ID	2.6E+6	NA
Naphthalene	91203	NA	35,000	730	2.5E+5	3.0E+5	3.0E+5	3.0E+5	2.0E+8	1.6E+7	NA

Nickel (B)	7440020	20,000	1.0E+5	(G)	NLV	NLV	NLV	NLV	1.3E+7	4.0E+7	NA
Nitrate (B,N)	14797558	NA	2.0E+5 (N)	ID	NLV	NLV	NLV	NLV	ID	ID	NA
Nitrite (B,N)	14797650	NA	20,000 (N)	NA	NLV	NLV	NLV	NLV	ID	ID	NA
Nitrobenzene (I)	98953	NA	330 (M); 68	3,600 (X)	91,000	54,000	54,000	54,000	4.7E+7	1.0E+5	4.9E+5
2-Nitrophenol	88755	NA	400	ID	NLV	NLV	NLV	NLV	ID	6.3E+5	NA
n-Nitroso-di-n-propylamine	621647	NA	330 (M); 100	NA	NLV	NLV	NLV	NLV	1.6E+6	1,200	1.5E+6
N-Nitrosodiphenylamine	86306	NA	5,400	NA	NLV	NLV	NLV	NLV	2.2E+9	1.7E+6	NA
Oxamyl	23135220	NA	4,000	NA	NLV	NLV	NLV	NLV	ID	8.6E+6	NA
Oxo-hexyl acetate	88230357	NA	1,500	NA	ID	ID	ID	ID	5.4E+9	2.3E+6	1.0E+7
Pendimethalin	40487421	NA	1.1E+6	NA	NLV	NLV	NLV	NLV	ID	4.6E+7	NA
Pentachlorobenzene	608935	NA	29,000	9,500	ID	ID	ID	ID	ID	3.2E+5 (C)	1.9E+5
Pentachloronitrobenzene	82688	NA	37,000	NA	1.2E+5	2.3E+5	2.3E+5	2.3E+5	3.3E+8	1.7E+6	NA
Pentachlorophenol	87865	NA	22	(G,X)	NLV	NLV	NLV	NLV	1.0E+8	90,000	NA
Pentane	109660	NA	ID	NA	9.7E+5 (C)	3.7E+7	3.1E+8	5.8E+8	1.2E+12	ID	2.4E+5

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Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Level	Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Direct Contact Criteria	Soil Saturation Concentration Screening Levels
2-Pentene (I)	109682	NA	ID	NA	ID	ID	ID	ID	ID	ID	2.2E+5
Phenanthrene	85018	NA	56,000	2,100	2.8E+6	1.6E+5	1.6E+5	1.6E+5	6.7E+6	1.6E+6	NA
Phenol	108952	NA	88,000	9,000	NLV	NLV	NLV	NLV	4.0E+10	4.0E+7 (C, DD)	1.2E+7
Phenytion	57410	NA	830	4300 (X)	NLV	NLV	NLV	NLV	2.2E+8	1.0E+5	NA
Phosphorus (Total)	7723140	NA	1.3E+6	(EE)	NLV	NLV	NLV	NLV	6.7E+7	1.0E+9 (D)	NA
Phthalic acid	88993	NA	2.8E+5	NA	NLV	NLV	NLV	NLV	ID	4.3E+8 (C)	1.7E+6
Phthalic anhydride	85449	NA	3.0E+5	NA	NLV	NLV	NLV	NLV	ID	4.7E+8 (C)	1.1E+6
Picloram	1918021	NA	10,000	920	NLV	NLV	NLV	NLV	ID	1.6E+7	NA
Piperidine	110894	NA	64	NA	NLV	NLV	NLV	NLV	9.3E+9	99,000	1.2E+8
Polybrominated biphenyls (J)	67774327	NA	NLL	NLL	NLV	NLV	NLV	NLV	ID	1,200	NA
Polychlorinated biphenyls (PCBs) (J,T)	1336363	NA	NLL	NLL	3.0E+6	2.4E+5	7.9E+6	7.9E+6	5.2E+6	(T)	NA

Prometon	1610180	NA	4,900	NA	NLV	NLV	NLV	NLV	ID	5.0E+6	NA
Propachlor	1918167	NA	1,900	NA	NLV	NLV	NLV	NLV	ID	2.9E+6	NA
Propazine	139402	NA	4,000	NA	NLV	NLV	NLV	NLV	ID	6.1E+6	NA
Propionic acid	79094	NA	2.4E+5	ID	NLV	NLV	NLV	NLV	2.0E+10	3.8E+8 (C)	1.1E+8
Propyl alcohol (I)	71238	NA	28,000	NA	NLV	NLV	NLV	NLV	4.9E+10	1.3E+7 (DD)	1.1E+8
n-Propylbenzene (I)	103651	NA	1,600	ID	ID	ID	ID	ID	1.3E+9	2.5E+6	1.0E+7
Propylene glycol	57556	NA	3.0E+6	5.8E+6	NLV	NLV	NLV	NLV	4.0E+11	1.0E+9 (C,D)	1.1E+8
Pyrene	129000	NA	4.8E+5	ID	1.0E+9 (D)	6.5E+8	6.5E+8	6.5E+8	6.7E+9	2.9E+7	NA
Pyridine (I)	110861	NA	400	NA	1,100	8,200	40,000	97,000	2.3E+8	2.3E+5 (C)	37,000
Selenium (B)	7782492	410	4,000	400	NLV	NLV	NLV	NLV	1.3E+8	2.6E+6	NA
Silver (B)	7440224	1,000	4,500	100 (M); 27	NLV	NLV	NLV	NLV	6.7E+6	2.5E+6	NA
Silvex (2,4,5-TP)	93721	NA	3,600	2,200	NLV	NLV	NLV	NLV	ID	1.7E+6	NA
Simazine	122349	NA	80	340	NLV	NLV	NLV	NLV	ID	1.2E+6	NA
Sodium	17341252	NA	4.6E+6	NA	NLV	NLV	NLV	NLV	ID	1.0E+9 (D)	NA
Sodium azide	26628228	NA	1,800	1,000	ID	ID	ID	ID	ID	2.7E+6	NA
Strontium (B)	7440246	NA	92,000	4.2E+5	NLV	NLV	NLV	NLV	ID	3.3E+8	NA

TABLE 2. SOIL: RESIDENTIAL**PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS**

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to 1 microgram per kilogram (ug/kg). Criteria with 6 or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (§324.20120a(10)). In these cases, 2 numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value.

Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Level	Groundwater Protection		Indoor Air	Ambient Air (Y) (C)				Contact	Csat
			Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Direct Contact Criteria	Soil Saturation Concentration Screening Levels
Styrene	100425	NA	2,700	2,100 (X)	2.5E+5	9.7E+5	9.7E+5	1.4E+6	5.5E+9	4.0E+5	5.2E+5
Sulfate	14808798	NA	5.0E+6	NA	NLV	NLV	NLV	NLV	ID	ID	NA
Tebuthiuron	34014181	NA	10,000	NA	NLV	NLV	NLV	NLV	ID	4.6E+6 (DD)	NA
2,3,7,8-Tetrabromodibenzo-p-dioxin (O)	50585416	NA	NLL	NLL	NLV	NLV	NLV	NLV	(O)	(O)	NA
1,2,4,5-Tetrachlorobenzene	95943	NA	1.5E+6	3,400 (X)	5.8E+5	2.3E+5	2.3E+5	2.3E+5	6.7E+7	7.7E+7	NA
2,3,7,8-Tetrachlorodibenzo-p-dioxin (O)	1746016	NA	NLL	NLL	NLV	NLV	NLV	NLV	71 (O)	0.09 (O)	NA
1,1,1,2-Tetrachloroethane	630206	NA	1,500	ID	6,200	36,000	54,000	1.0E+5	4.2E+8	4.8E+5 (C)	4.4E+5
1,1,2,2-Tetrachloroethane	79345	NA	170	1,600 (X)	4,300	10,000	10,000	14,000	5.4E+7	53,000	8.7E+5
Tetrachloroethylene	127184	NA	100	1,200 (X)	11,000	1.7E+5	4.8E+5	1.1E+6	2.7E+9	2.0E+5 (C)	88,000

Tetrahydrofuran	109999	NA	1,900	2.2E+5 (X)	1.3E+6	1.3E+7	6.7E+7	1.6E+8	3.9E+11	2.9E+6	1.2E+8
Tetranitromethane	509148	NA	ID	NA	500(M); 110	500 (M); 51	ID	ID	2.1E+5	ID	ID
Thallium (B)	7440280	NA	2,300	4,200 (X)	NLV	NLV	NLV	NLV	1.3E+7	35,000	NA
Toluene (I)	108883	NA	16,000	5,400	3.3E+5 (C)	2.8E+6	5.1E+6	1.2E+7	2.7E+10	5.0E+7 (C)	2.5E+5
p-Toluidine	106490	NA	660 (M); 300	NA	NLV	NLV	NLV	NLV	1.0E+8	94,000	1.2E+6
Toxaphene	8001352	NA	24,000	8,200	NLV	NLV	NLV	NLV	9.7E+6	20,000	NA
Triallate	2303175	NA	95,000	NA	ID	ID	ID	ID	ID	2.9E+6 (C)	2.5E+5
Tributylamine	102829	NA	7,800	ID	5.8E+5	6.0E+5	6.0E+5	6.0E+5	4.7E+8	7.9E+5	3.7E+6
1,2,4-Trichlorobenzene	120821	NA	4,200	5,900 (X)	9.6E+6 (C)	2.8E+7	2.8E+7	2.8E+7	2.5E+10	9.9E+5 (DD)	1.1E+6
1,1,1-Trichloroethane	71556	NA	4,000	1,800	2.5E+5	3.8E+6	1.2E+7	2.8E+7	6.7E+10	5.0E+8 (C)	4.6E+5
1,1,2-Trichloroethane	79005	NA	100	6,600 (X)	4,600	17,000	21,000	44,000	1.9E+8	1.8E+5	9.2E+5
Trichloroethylene	79016	NA	100	4,000 (X)	1,000	11,000	25,000	57,000	1.3E+8	1.1E+5 (DD)	5.0E+5
Trichlorofluoromethane	75694	NA	52,000	NA	2.8E+6 (C)	9.2E+7	6.3E+8	1.5E+9	3.8E+12	7.9E+7 (C)	5.6E+5
2,4,5-Trichlorophenol	95954	NA	39,000	NA	NLV	NLV	NLV	NLV	2.3E+10	2.3E+7	NA
2,4,6-Trichlorophenol	88062	NA	2,400	330 (M); 100	NLV	NLV	NLV	NLV	1.0E+9	7.1E+5	NA
1,2,3-Trichloropropane	96184	NA	840	NA	4,000	9,200	9,200	11,000	2.0E+7	1.3E+6 (C)	8.3E+5
1,1,2-Trichloro-1,2,2-trifluoroethane	76131	NA	9.0E+6 (C)	1,700	5.1E+6 (C)	1.8E+8	8.8E+8	2.1E+9	5.1E+12	1.0E+9 (C,D)	5.5E+5
Triethanolamine	102716	NA	74,000	NA	NLV	NLV	NLV	NLV	3.3E+9	1.1E+8	1.1E+8

TABLE 2. SOIL: RESIDENTIAL**PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS**

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to 1 microgram per kilogram (ug/kg). Criteria with 6 or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (§324.20120a(10)). In these cases, 2 numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value.

Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Level	Groundwater Protection		Indoor Air	Ambient Air (Y) (C)				Contact	Csat
			Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Direct Contact Criteria	Soil Saturation Concentration Screening Levels
Triethylene glycol	112276	NA	86,000	NA	NLV	NLV	NLV	NLV	ID	3.9E+7 (C,DD)	1.1E+5
3-Trifluoromethyl-4-nitrophenol	88302	NA	1.1E+5	NA	NLV	NLV	NLV	NLV	ID	4.1E+7 (DD)	NA
Trifluralin	1582098	NA	1.9E+5	NA	ID	ID	ID	ID	ID	2.0E+6	NA
2,2,4-Trimethyl pentane	540841	NA	ID	NA	1.1E+5 (C)	5.2E+6	3.9E+7	9.6E+7	2.3E+11	ID	19,000
2,4,4-Trimethyl-2-pentene (I)	107404	NA	ID	NA	ID	ID	ID	ID	ID	ID	56,000
1,2,4-Trimethylbenzene (I)	95636	NA	2,100	570	4.3E+6 (C)	2.1E+7	5.0E+8	5.0E+8	8.2E+10	3.2E+7 (C)	1.1E+5
1,3,5-Trimethylbenzene (I)	108678	NA	1,800	1,100	2.6E+6 (C)	1.6E+7	3.8E+8	3.8E+8	8.2E+10	3.2E+7 (C)	94,000

Triphenyl phosphate	115866	NA	1.5E+6 (C)	NA	NLV	NLV	NLV	NLV	ID	3.6E+7 (C)	1.1E+5
tris(2,3-Dibromopropyl)phosphate	126727	NA	930	ID	82,000 (C)	18,000	18,000	18,000	5.9E+6	4,400	27,000
Urea	57136	NA	ID	NA	NLV	NLV	NLV	NLV	ID	ID	NA
Vanadium	7440622	NA	72,000	4.3E+5	NLV	NLV	NLV	NLV	ID	7.5E+5 (DD)	NA
Vinyl acetate (I)	108054	NA	13,000	NA	7.9E+5	1.7E+6	2.6E+6	5.8E+6	1.3E+10	5.8E+6 (C,DD)	2.4E+6
Vinyl chloride	75014	NA	40	260 (X)	270	4,200	30,000	73,000	3.5E+8	3,800	4.9E+5
White phosphorus (R)	12185103	NA	2.2	NA	NLV	NLV	NLV	NLV	ID	2,300 (DD)	NA
Xylenes (I)	1330207	NA	5,600	820	6.3E+6 (C)	4.6E+7	6.1E+7	1.3E+8	2.9E+11	4.1E+8 (C)	1.5E+5
Zinc (B)	7440666	47,000	2.4E+6	(G)	NLV	NLV	NLV	NLV	ID	1.7E+8	NA

R 299.48 Generic soil cleanup criteria for nonresidential category.

Rule 48. Generic soil cleanup criteria for nonresidential category shall be as shown in table 3.

**TABLE 3. SOIL: NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS**

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to 1 microgram per kilogram (ug/kg). Criteria with 6 or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (§324.20120a(10)). In these cases, 2 numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value.

Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Groundwater Protection			Indoor Air	Ambient Air (Y) (C)				Contact	Csat
			Residential Drinking Water Protection Criteria	Nonresidential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Direct Contact Criteria	Soil Saturation Concentration Screening Levels
Acenaphthene	83329	NA	3.0E+5	8.8E+5	8,700	3.5E+8	9.7E+7	9.7E+7	9.7E+7	6.2E+9	1.3E+8	NA
Acenaphthylene	208968	NA	5,900	17,000	ID	3.0E+6	2.7E+6	2.7E+6	2.7E+6	1.0E+9	5.2E+6	NA
Acetaldehyde (I)	75070	NA	19,000	54,000	2,600	4.0E+5	2.1E+5	2.1E+5	2.9E+5	2.6E+8	9.5E+7	1.1E+8
Acetate	71501	NA	ID	ID	(G)	ID	ID	ID	ID	ID	ID	ID
Acetic acid	64197	NA	84,000	2.4E+5	(G)	NLV	NLV	NLV	NLV	7.4E+9	4.2E+8	6.5E+8
Acetone (I)	67641	NA	15,000	42,000	34,000	5.4E+8 (C)	1.6E+8	1.6E+8	2.0E+8	1.7E+11	7.3E+7	1.1E+8
Acetonitrile	75058	NA	2,800	8,000	NA	8.8E+6	1.9E+6	1.9E+6	2.2E+6	1.8E+9	1.4E+7	2.2E+7
Acetophenone	98862	NA	30,000	88,000	ID	2.1E+8 (C)	5.2E+7	5.2E+7	5.2E+7	1.4E+10	1.5E+8 (C)	1.1E+6
Acrolein (I)	107028	NA	2,400	6,600	NA	760	370	370	630	5.9E+5	1.2E+7	2.3E+7
Acrylamide	79061	NA	10	10	200 (X)	NLV	NLV	NLV	NLV	3.0E+6	8,700	NA

Acrylic acid	79107	NA	78,000	2.2E+5	NA	5.5E+6	2.2E+5	2.7E+5	2.7E+5	2.9E+7	2.1E+8 (C,DD)	1.1E+8
Acrylonitrile (I)	107131	NA	100 (M); 52	220	100 (M); 40	35,000	17,000	17,000	31,000	5.8E+7	74,000	8.3E+6
Alachlor	15972608	NA	52	52	290 (X)	NLV	NLV	NLV	NLV	ID	3.9E+5	NA
Aldicarb	116063	NA	60	60	NA	NLV	NLV	NLV	NLV	ID	7.3E+5	NA
Aldicarb sulfone	1646884	NA	200 (M); 40	200 (M); 40	NA	NLV	NLV	NLV	NLV	ID	8.0E+5	NA
Aldicarb sulfoxide	1646873	NA	200(M); 80	200 (M); 80	NA	NLV	NLV	NLV	NLV	ID	9.5E+5	NA
Aldrin	309002	NA	NLL	NLL	NLL	7.1E+6	2.0E+5	2.0E+5	2.0E+5	8.0E+5	4,300	NA
Aluminum (B)	7429905	6.9E+6	1,000	1,000	NA	NLV	NLV	NLV	NLV	ID	3.7E+8 (DD)	NA
Ammonia	7664417	NA	ID	ID	(CC)	ID	ID	ID	ID	2.9E+9	ID	1.0E+7
t-Amyl methyl ether (TAME)	994058	NA	3,900	3,900	NA	1.1E+5	4.0E+5	7.8E+5	1.8E+6	1.8E+9	9.5E+7 (C)	4.4E+5
Aniline	62533	NA	1,100	4,400	330 (M); 80	NLV	NLV	NLV	NLV	2.9E+7	1.5E+6	4.5E+6
Anthracene	120127	NA	41,000	41,000	ID	1.0E+9 (D)	1.6E+9	1.6E+9	1.6E+9	2.9E+10	7.3E+8	NA
Antimony	7440360	NA	4,300	4,300	94,000 (X)	NLV	NLV	NLV	NLV	5.9E+6	6.7E+5	NA
Arsenic	7440382	5,800	4,600	4,600	4,600	NLV	NLV	NLV	NLV	9.1E+5	37,000	NA
Asbestos (BB)	1332214	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	1.0E+7 (M); 85,000	ID	NA
Atrazine	1912249	NA	60	60	150	NLV	NLV	NLV	NLV	ID	3.3E+5 (DD)	NA
Azobenzene	103333	NA	4,200	17,000	ID	3.2E+7	2.1E+6	2.1E+6	2.1E+6	1.3E+8	6.6E+5	NA

**TABLE 3. SOIL: NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;**

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to 1 microgram per kilogram (ug/kg). Criteria with 6 or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (§324.20120a(10)). In these cases, 2 numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value.

Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Groundwater Protection			Indoor Air	Ambient Air (Y) (C)				Contact	Csat
			Residential Drinking Water Protection Criteria & RBSLs	Nonresidential Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
Barium (B)	7440393	75,000	1.3E+6	1.3E+6	(G)	NLV	NLV	NLV	NLV	1.5E+8	1.3E+8	NA
Benzene (I)	71432	NA	100	100	4,000 (X)	8,400	45,000	99,000	2.3E+5	4.7E+8	8.4E+5 (C)	4.0E+5
Benzidine	92875	NA	1,000 (M); 6.0	1,000 (M); 6.0	1,000 (M); 6.0	NLV	NLV	NLV	NLV	59,000	1,000 (M); 110	NA
Benzo(a)anthracene (Q)	56553	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	80,000	NA
Benzo(b)fluoranthene (Q)	205992	NA	NLL	NLL	NLL	ID	ID	ID	ID	ID	80,000	NA
Benzo(k)fluoranthene (Q)	207089	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	8.0E+5	NA
Benzo(g,h,i)perylene	191242	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	3.5E+8	7.0E+6	NA

Benzo(a)pyrene (Q)	50328	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	1.9E+6	8,000	NA
Benzoic acid	65850	NA	6.4E+5	1.8E+6	NA	NLV	NLV	NLV	NLV	ID	1.0E+9 (D)	NA
Benzyl alcohol	100516	NA	2.0E+5	5.8E+5	NA	NLV	NLV	NLV	NLV	1.5E+11	1.0E+9 (C,D)	5.8E+6
Benzyl chloride	100447	NA	150	640	NA	33,000	48,000	48,000	52,000	7.8E+7	2.2E+5	2.3E+5
Beryllium	7440417	NA	51,000	51,000	(G)	NLV	NLV	NLV	NLV	5.9E+5	1.6E+6	NA
bis(2-Chloroethoxy)ethane	112265	NA	ID	ID	ID	NLV	NLV	NLV	NLV	ID	ID	2.7E+6
bis(2-Chloroethyl)ether (I)	111444	NA	100	170	100 (M); 20	44,000	13,000	13,000	13,000	1.2E+7	58,000	2.2E+6
bis(2-Ethylhexyl)phthalate	117817	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	8.9E+8	1.2E+7 (C)	1.0E+7
Boron (B)	7440428	NA	10,000	10,000	1.4E+5 (X)	NLV	NLV	NLV	NLV	ID	3.5E+8 (DD)	NA
Bromate	15541454	NA	200	200	800 (X)	NLV	NLV	NLV	NLV	ID	91,000	NA
Bromobenzene (I)	108861	NA	550	1,500	NA	5.8E+5	5.4E+5	5.4E+5	5.4E+5	2.4E+8	1.7E+6 (C)	7.6E+5
Bromodichloromethane	75274	NA	1,600 (W)	1,600 (W)	ID	6,400	31,000	31,000	57,000	1.1E+8	4.9E+5	1.5E+6
Bromoform	75252	NA	1,600 (W)	1,600 (W)	ID	7.7E+5	3.1E+6	3.1E+6	3.1E+6	3.6E+9	3.8E+6 (C)	8.7E+5
Bromomethane	74839	NA	200	580	700	1,600	13,000	57,000	1.4E+5	1.5E+8	1.0E+6	2.2E+6
n-Butanol (I)	71363	NA	19,000	54,000	2.00E+05	NLV	NLV	NLV	NLV	1.0E+10	9.5E+7 (C)	8.7E+6
2-Butanone (MEK) (I)	78933	NA	2.6E+5	7.6E+5	44,000	9.9E+7 (C)	3.5E+7	3.5E+7	3.6E+7	2.9E+10	7.0E+8 (C,DD)	2.7E+7
n-Butyl acetate	123864	NA	11,000	32,000	NA	1.0E+8 (C)	1.4E+8	3.1E+8	3.5E+8	2.1E+11	5.5E+7 (C)	1.1E+6
t-Butyl alcohol	75650	NA	78,000	2.2E+5	NA	5.8E+8 (C)	1.2E+8	2.4E+8	2.4E+8	5.6E+10	3.9E+8 (C)	1.1E+8
Butyl benzyl phthalate	85687	NA	2.2E+6 (C)	5.0E+6 (C)	1.2E+5 (X)	NLV	NLV	NLV	NLV	2.1E+10	1.2E+8 (C)	3.1E+5
n-Butylbenzene	104518	NA	1,600	4,600	ID	ID	ID	ID	ID	8.8E+8	8.0E+6	1.0E+7

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Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Groundwater Protection			Indoor Air	Ambient Air (Y) (C)				Contact	Csat
			Residential Drinking Water Protection Criteria & RBSLs	Nonresidential Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
sec-Butylbenzene	135988	NA	1,600	4,600	ID	ID	ID	ID	ID	1.8E+8	8.0E+6	1.0E+7
t-Butylbenzene (I)	98066	NA	1,600	4,600	ID	ID	ID	ID	ID	2.9E+8	8.0E+6	1.0E+7
Cadmium (B)	7440439	1,200	6,000	6,000	(G,X)	NLV	NLV	NLV	NLV	2.2E+6	2.1E+6	NA
Camphene (I)	79925	NA	ID	ID	NA	6,700	1.8E+5	9.1E+5	2.2E+6	2.4E+9	ID	NA

Caprolactam	105602	NA	1.2E+5	3.4E+5	NA	NLV	NLV	NLV	NLV	2.9E+8	3.1E+8 (DD)	NA
Carbaryl	63252	NA	14,000	40,000	NA	ID	ID	ID	ID	ID	7.0E+7	NA
Carbazole	86748	NA	9,400	39,000	1,100	NLV	NLV	NLV	NLV	7.8E+7	2.4E+6	NA
Carbofuran	1563662	NA	800	800	NA	NLV	NLV	NLV	NLV	ID	3.6E+6	NA
Carbon disulfide (I,R)	75150	NA	16,000	46,000	ID	1.4E+5	1.6E+6	8.0E+6	1.9E+7	2.1E+10	4.3E+7 (C,DD)	2.8E+5
Carbon tetrachloride	56235	NA	100	100	900 (X)	990	12,000	34,000	79,000	1.7E+8	4.4E+5 (C)	3.9E+5
Chlordane (J)	57749	NA	NLL	NLL	NLL	5.9E+7	4.2E+6	4.2E+6	4.2E+6	2.1E+7	1.5E+5	NA
Chloride	16887006	NA	5.0E+6	5.0E+6	(X)	NLV	NLV	NLV	NLV	ID	5.0E+5 (F)	NA
Chlorobenzene (I)	108907	NA	2,000	2,000	500	2.2E+5	9.2E+5	1.1E+6	2.1E+6	2.1E+9	1.4E+7 (C)	2.6E+5
p-Chlorobenzene sulfonic acid	98668	NA	1.5E+5	4.2E+5	ID	ID	ID	ID	ID	ID	7.3E+8	ID
1-Chloro-1,1-difluoroethane	75683	NA	3.0E+5	8.8E+5	NA	5.4E+6 (C)	9.4E+7	5.7E+8	1.4E+9	1.5E+12	1.0E+9 (C,D)	9.6E+5
Chloroethane	75003	NA	8,600	34,000	22,000 (X)	5.3E+6 (C)	3.6E+7	1.2E+8	2.8E+8	2.9E+11	1.2E+7 (C)	9.5E+5
2-Chloroethyl vinyl ether	110758	NA	ID	ID	NA	ID	ID	ID	ID	ID	ID	1.9E+6
Chloroform	67663	NA	1,600 (W)	1,600 (W)	7,000	38,000	1.5E+5	3.4E+5	7.9E+5	1.6E+9	5.5E+6 (C)	1.5E+6
Chloromethane (I)	74873	NA	5,200	22,000	ID	10,000	1.2E+5	1.0E+6	2.5E+6	2.6E+9	7.4E+6 (C)	1.1E+6
4-Chloro-3-methylphenol	59507	NA	5,800	16,000	280	NLV	NLV	NLV	NLV	ID	1.5E+7	NA
beta-Chloronaphthalene	91587	NA	6.2E+5	1.8E+6	NA	ID	ID	ID	ID	ID	1.8E+8	NA
2-Chlorophenol	95578	NA	900	2,600	360	8.0E+5	1.1E+6	1.1E+6	1.1E+6	5.3E+8	4.5E+6	1.9E+7
o-Chlorotoluene (I)	95498	NA	3,300	9,300	ID	5.0E+5	1.5E+6	3.1E+6	6.4E+6	2.1E+9	1.5E+7 (C)	5.0E+5
Chlorpyrifos	2921882	NA	17,000	48,000	1,500	240	5,500	23,000	56,000	5.9E+7	3.4E+7	NA
Chromium (III) (B,H)	16065831	18,000 (total)	1.0E+9 (D)	1.0E+9 (D)	(G,X)	NLV	NLV	NLV	NLV	1.5E+8	1.0E+9 (D)	NA
Chromium (VI)	18540299	NA	30,000	30,000	3,300	NLV	NLV	NLV	NLV	2.4E+5	9.2E+6	NA
Chrysene (Q)	218019	NA	NLL	NLL	NLL	ID	ID	ID	ID	ID	8.0E+6	NA

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			Residential Drinking Water Protection Criteria & RBSLs	Nonresidential Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
Cobalt	7440484	6,800	800	2,000	2,000	NLV	NLV	NLV	NLV	5.9E+6	9.0E+6	NA

Copper (B)	7440508	32,000	5.8E+6	5.8E+6	(G)	NLV	NLV	NLV	NLV	5.9E+7	7.3E+7	NA
Cyanazine	21725462	NA	200	200	1,100 (X)	NLV	NLV	NLV	NLV	ID	66,000	NA
Cyanide (P,R)	57125	390 (total)	4,000	4,000	100	NLV	NLV	NLV	NLV	2.5E+5	2.5E+5	NA
Cyclohexanone	108941	NA	5.2E+6	1.5E+7	NA	32,000	1.3E+6	1.1E+7	2.7E+7	2.9E+10	1.0E+9 (C,D)	2.2E+8
Dacthal	1861321	NA	50,000	1.4E+5	NA	NLV	NLV	NLV	NLV	ID	7.3E+6	NA
Dalapon	75990	NA	4,000	4,000	NA	NLV	NLV	NLV	NLV	ID	6.2E+7 (C)	5.9E+7
4-4'-DDD	72548	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	5.6E+7	4.0E+5	NA
4-4'-DDE	72559	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	4.0E+7	1.9E+5	NA
4-4'-DDT	50293	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	4.0E+7	2.8E+5	NA
Decabromodiphenyl ether	1163195	NA	1.4E+5	1.4E+5	NA	1.0E+9 (D)	1.0E+8	1.0E+8	1.0E+8	1.0E+9	1.1E+7	NA
Di-n-butyl phthalate	84742	NA	9.6E+5 (C)	2.7E+6 (C)	11,000	NLV	NLV	NLV	NLV	1.5E+9	8.7E+7 (C)	7.6E+5
Di(2-ethylhexyl) adipate	103231	NA	1.3E+7 (C)	1.3E+7 (C)	ID	NLV	NLV	NLV	NLV	1.2E+10	6.3E+7 (C,DD)	9.6E+5
Di-n-octyl phthalate	117840	NA	1.0E+8	2.9E+8 (C)	ID	NLV	NLV	NLV	NLV	1.4E+10	2.0E+7	1.4E+8
Diacetone alcohol (I)	123422	NA	ID	ID	NA	NLV	NLV	NLV	NLV	7.1E+10	ID	1.1E+8
Diazinon	333415	NA	95	280	72	NLV	NLV	NLV	NLV	ID	70,000 (DD)	3.1E+5
Dibenzo(a,h)anthracene (Q)	53703	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	8,000	NA
Dibenzofuran	132649	NA	ID	ID	1,700	3.6E+6	1.6E+5	1.6E+5	1.6E+5	2.9E+6	ID	NA
Dibromochloromethane	124481	NA	1,600 (W)	1,600 (W)	ID	21,000	80,000	80,000	98,000	1.6E+8	5.0E+5	6.1E+5
Dibromochloropropane	96128	NA	10 (M); 4.0	10 (M); 4.0	ID	1,200	900	900	900	7.0E+5	20,000 (C)	1,200
Dibromomethane	74953	NA	1,600	4,600	NA	ID	ID	ID	ID	ID	8.0E+6 (C)	2.0E+6
Dicamba	1918009	NA	4,400	13,000	NA	NLV	NLV	NLV	NLV	ID	1.7E+7	NA
1,2-Dichlorobenzene	95501	NA	14,000	14,000	280	2.0E+7 (C)	4.6E+7	4.6E+7	5.5E+7	4.4E+10	6.3E+7 (C)	2.1E+5
1,3-Dichlorobenzene	541731	NA	170	480	680	48,000	94,000	94,000	1.1E+5	8.8E+7	6.6E+5 (C)	1.7E+5
1,4-Dichlorobenzene	106467	NA	1,700	1,700	360	1.0E+5	2.6E+5	2.6E+5	3.4E+5	5.7E+8	1.9E+6	NA
3,3'-Dichlorobenzidine	91941	NA	2,000 (M); 28	2,000 (M); 110	2,000 (M); 7.4	NLV	NLV	NLV	NLV	8.2E+6	30,000	NA
Dichlorodifluoromethane	75718	NA	95,000	2.7E+5	ID	1.7E+6	6.3E+7	5.5E+8	1.4E+9	1.5E+12	1.7E+8 (C)	1.0E+6

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			Groundwater Protection			Indoor Air	Ambient Air (Y) (C)				Contact	Csat
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria & RBSLs	Nonresidential Drinking Water Protection Criteria &	Groundwater Surface Water Interface Protection	Soil Volatilization to Indoor Air Inhalation	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source	Finite VSIC for 2 Meter Source	Particulate Soil Inhalation Criteria &	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels

				RBSLs	Criteria & RBSLs	Criteria & RBSLs	& RBSLs	Thickness	Thickness	RBSLs		
1,1-Dichloroethane	75343	NA	18,000	50,000	15,000	4.3E+5	2.5E+6	6.0E+6	1.4E+7	1.5E+10	8.7E+7 (C)	8.9E+5
1,2-Dichloroethane (I)	107062	NA	100	100	7,200 (X)	11,000	21,000	33,000	74,000	1.5E+8	4.2E+5	1.2E+6
1,1-Dichloroethylene (I)	75354	NA	140	140	2,600	330	3,700	15,000	37,000	7.8E+7	6.6E+5 (C)	5.7E+5
cis-1,2-Dichloroethylene	156592	NA	1,400	1,400	12,000	41,000	2.1E+5	4.3E+5	1.0E+6	1.0E+9	8.0E+6 (C)	6.4E+5
trans-1,2-Dichloroethylene	156605	NA	2,000	2,000	30,000 (X)	43,000	3.3E+5	8.4E+5	2.0E+6	2.1E+9	1.2E+7 (C)	1.4E+6
2,6-Dichloro-4-nitroaniline	99309	NA	44,000	1.3E+5	NA	NLV	NLV	NLV	NLV	ID	2.2E+8	NA
2,4-Dichlorophenol	120832	NA	1,500	4,200	330 (M); 220	NLV	NLV	NLV	NLV	2.3E+9	3.9E+6 (C,DD)	1.8E+6
2,4-Dichlorophenoxyacetic acid	94757	NA	1,400	1,400	4,400	NLV	NLV	NLV	NLV	2.9E+9	8.6E+6	NA
1,2-Dichloropropane (I)	78875	NA	100	100	4,600 (X)	7,400	30,000	51,000	1.2E+5	1.2E+8	6.6E+5 (C)	5.5E+5
1,3-Dichloropropene	542756	NA	170	700	180 (X)	5,400	60,000	2.0E+5	4.7E+5	5.9E+8	2.4E+5	6.2E+5
Dichlorovos	62737	NA	50 (M); 32	130	NA	NLV	NLV	NLV	NLV	1.5E+7	47,000	2.2E+6
Dicyclohexyl phthalate	84617	NA	ID	ID	NA	ID	ID	ID	ID	ID	ID	NA
Dieldrin	60571	NA	NLL	NLL	NLL	7.2E+5	64,000	64,000	64,000	8.5E+5	4,700	NA
Diethyl ether	60297	NA	200	200	ID	5.2E+7 (C)	1.0E+8	1.6E+8	3.5E+8	3.5E+11	3.6E+8 (C)	7.4E+6
Diethyl phthalate	84662	NA	1.1E+5	3.2E+5	2,200	NLV	NLV	NLV	NLV	1.5E+9	5.5E+8 (C)	7.4E+5
Diethylene glycol monobutyl ether	112345	NA	1,800	5,000	NA	NLV	NLV	NLV	NLV	5.9E+8	8.7E+6	1.1E+8
Diisopropyl ether	108203	NA	600	1,700 (C)	ID	1.2E+6 (C)	3.2E+6	4.8E+6	1.0E+7	1.1E+10	3.0E+6 (C)	1,300
Diisopropylamine (I)	108189	NA	110	320	NA	1.0E+7 (C)	7.4E+6	7.4E+6	7.7E+6	5.9E+9	5.6E+5	6.7E+6
Dimethyl phthalate	131113	NA	1.5E+6 (C)	4.2E+6 (C)	NA	NLV	NLV	NLV	NLV	1.5E+9	1.0E+9 (C,D)	7.9E+5
N,N-Dimethylacetamide	127195	NA	3,600	10,000	82,000 (X)	NLV	NLV	NLV	NLV	ID	1.8E+7	1.1E+8
N,N-Dimethylaniline	121697	NA	320	920	NA	8.9E+5 (C)	5.2E+5	5.2E+5	5.2E+5	3.3E+8	1.6E+6 (C)	8.0E+5
Dimethylformamide (I)	68122	NA	14,000	40,000	NA	NLV	NLV	NLV	NLV	8.8E+8	7.0E+7	1.1E+8
2,4-Dimethylphenol	105679	NA	7,400	20,000	7,600	NLV	NLV	NLV	NLV	2.1E+9	3.6E+7	NA
2,6-Dimethylphenol	576261	NA	330 (M); 88	330 (M); 260	NA	NLV	NLV	NLV	NLV	5.9E+7	4.4E+5	NA
3,4-Dimethylphenol	95658	NA	330 (M); 200	580	500	NLV	NLV	NLV	NLV	1.0E+8	1.0E+6	NA
Dimethylsulfoxide	67685	NA	4.4E+6	1.3E+7	3.8E+6	NLV	NLV	NLV	NLV	5.9E+8	1.0E+9 (C,D)	1.8E+7
2,4-Dinitrotoluene	121142	NA	430	640	NA	NLV	NLV	NLV	NLV	2.0E+7	2.2E+5	NA

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Dinoseb	88857	NA	300	300	200 (M); 43	NLV	NLV	NLV	NLV	1.2E+8	3.9E+5 (C,DD)	1.4E+5
1,4-Dioxane (I)	123911	NA	1,700	7,000	56,000 (X)	NLV	NLV	NLV	NLV	7.1E+8	2.4E+6	9.7E+7
Diquat	85007	NA	400	400	400	NLV	NLV	NLV	NLV	ID	1.6E+6	NA
Diuron	330541	NA	620	1,800	NA	NLV	NLV	NLV	NLV	2.1E+8	3.1E+6	NA
Endosulfan (J)	115297	NA	NLL	NLL	NLL	ID	ID	ID	ID	ID	4.4E+6	NA
Endothall	145733	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	1.0E+9	1.2E+7	NA
Endrin	72208	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	1.9E+5	NA
Epichlorohydrin (I)	106898	NA	100	100	NA	1.2E+5	37,000	37,000	37,000	2.9E+7	41,000	7.3E+6
Ethanol (I)	64175	NA	3.8E+7	7.6E+7	ID	NLV	NLV	NLV	NLV	5.6E+11	1.0E+9 (C,D,DDD)	1.1E+8
Ethyl acetate (I)	141786	NA	1.3E+5	3.8E+5	NA	7.0E+7 (C)	5.9E+7	5.9E+7	1.0E+8	9.4E+10	6.6E+8 (C)	7.5E+6
Ethyl-tert-butyl ether (ETBE)	637923	NA	980	980	ID	1.7E+6 (C)	2.3E+6	4.6E+6	1.1E+7	1.1E+10	ID	6.5E+5
Ethylbenzene (I)	100414	NA	1,500	1,500	360	4.6E+5 (C)	2.4E+6	3.1E+6	6.5E+6	1.3E+10	7.1E+7 (C)	1.4E+5
Ethylene dibromide	106934	NA	20 (M); 1.0	20 (M); 1.0	110 (X)	3,600	5,800	5,800	9,800	1.8E+7	430	8.9E+5
Ethylene glycol	107211	NA	3.0E+5	8.4E+5	3.8E+6 (X)	NLV	NLV	NLV	NLV	2.9E+10	1.0E+9 (C,D)	1.1E+8
Ethylene glycol monobutyl ether	111762	NA	74,000	2.0E+5	NA	1.4E+6	2.1E+7	1.5E+8	3.6E+8	3.8E+11	3.6E+8 (C)	4.1E+7
Fluoranthene	206440	NA	7.3E+5	7.3E+5	5,500	1.0E+9 (D)	8.9E+8	8.8E+8	8.8E+8	4.1E+9	1.3E+8	NA
Fluorene	86737	NA	3.9E+5	8.9E+5	5,300	1.0E+9 (D)	1.5E+8	1.5E+8	1.5E+8	4.1E+9	8.7E+7	NA
Fluorine (soluble fluoride) (B)	7782414	NA	40,000	40,000	ID	NLV	NLV	NLV	NLV	ID	6.7E+7 (DD)	NA
Formaldehyde	50000	NA	26,000	76,000	2,400	65,000	43,000	69,000	1.5E+5	2.6E+8	1.3E+8 (C)	6.0E+7
Formic acid (I,U)	64186	NA	2.0E+5	5.8E+5	ID	2.8E+6	2.6E+5	1.6E+5	1.6E+5	5.9E+7	1.0E+9 (C,D)	1.1E+8
1-Formylpiperidine	2591868	NA	1,600	4,600	NA	ID	ID	ID	ID	ID	8.0E+6	1.0E+7
Gentian violet	548629	NA	300	1,300	NA	NLV	NLV	NLV	NLV	ID	4.4E+5	NA
Glyphosate	1071836	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	5.7E+7 (DD)	NA
Heptachlor	76448	NA	NLL	NLL	NLL	1.9E+6	2.1E+5	2.1E+5	2.1E+5	3.0E+6	23,000	NA
Heptachlor epoxide	1024573	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	1.5E+6	9,500	NA
n-Heptane	142825	NA	4.6E+7 (C)	1.3E+8 (C)	NA	2.7E+6 (C)	2.5E+7	4.5E+7	1.0E+8	1.0E+11	1.0E+9 (C,D)	2.4E+5

**TABLE 3. SOIL: NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;**

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based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (§324.20120a(10)). In these cases, 2 numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value.

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Hexabromobenzene	87821	NA	5,400	5,400	ID	ID	ID	ID	ID	ID	3.1E+6	NA
Hexachlorobenzene (C-66)	118741	NA	1,800	1,800	350	2.2E+5	56,000	56,000	56,000	8.5E+6	37,000	NA
Hexachlorobutadiene (C-46)	87683	NA	26,000	72,000	91	7.1E+5 (C)	4.6E+5	4.6E+5	4.6E+5	1.8E+8	4.7E+5 (C)	3.5E+5
alpha-Hexachlorocyclohexane	319846	NA	18	71	ID	1.6E+5	41,000	86,000	86,000	2.1E+6	12,000	NA
beta-Hexachlorocyclohexane	319857	NA	37	150	ID	NLV	NLV	NLV	NLV	7.4E+6	25,000	NA
Hexachlorocyclopentadiene (C-56)	77474	NA	3.2E+5	3.2E+5	ID	56,000	60,000	60,000	60,000	5.9E+6	6.7E+6 (C)	7.2E+5
Hexachloroethane	67721	NA	430	1,200	1,800 (X)	79,000	6.6E+5	1.4E+6	1.4E+6	1.0E+8	7.3E+5	NA
n-Hexane	110543	NA	1.8E+5 (C)	5.1E+5 (C)	NA	9.5E+5 (C)	3.5E+6	3.5E+6	6.4E+6	5.9E+9	3.0E+8 (C)	44,000
2-Hexanone	591786	NA	20,000	58,000	ID	1.8E+6	1.3E+6	1.3E+6	1.5E+6	1.2E+9	1.0E+8 (C)	2.5E+6
Indeno(1,2,3-cd)pyrene (Q)	193395	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	80,000	NA
Iron (B)	7439896	1.2E+7	6,000	6,000	NA	NLV	NLV	NLV	NLV	ID	5.8E+8	NA
Isobutyl alcohol (I)	78831	NA	46,000	1.3E+5	NA	4.3E+8 (C)	9.5E+7	9.5E+7	9.5E+7	4.4E+10	2.3E+8 (C)	8.9E+6
Isophorone	78591	NA	15,000	62,000	26,000 (X)	NLV	NLV	NLV	NLV	8.2E+9	2.2E+7 (C)	2.4E+6
Isopropyl alcohol (I)	67630	NA	9,400	26,000	1.1E+6 (X)	NLV	NLV	NLV	NLV	6.5E+9	4.7E+7	1.1E+8
Isopropyl benzene	98828	NA	91,000	2.6E+5	3,200	7.3E+5 (C)	2.0E+6	2.0E+6	3.0E+6	2.6E+9	8.0E+7 (C)	3.9E+5
Lead (B)	7439921	21,000	7.0E+5	7.0E+5	(G,X)	NLV	NLV	NLV	NLV	4.4E+7	9.0E+5 (DD)	NA
Lindane	58899	NA	20 (M); 7.0	20 (M); 7.0	20 (M); 1.1	ID	ID	ID	ID	ID	42,000	NA
Lithium (B)	7439932	9,800	3,400	7,000	8,800	NLV	NLV	NLV	NLV	1.0E+9	3.1E+7 (DD)	NA
Magnesium (B)	7439954	NA	8.0E+6	2.2E+7	NA	NLV	NLV	NLV	NLV	2.9E+9	1.0E+9 (D)	NA
Manganese (B)	7439965	4.4E+5	1,000	1,000	(G,X)	NLV	NLV	NLV	NLV	1.5E+6	9.0E+7	NA
Mercury (Total) (B,Z)	Varies	130	1,700	1,700	50 (M); 1.2	89,000	62,000	62,000	62,000	8.8E+6	5.8E+5	NA
Methane	74828	NA	ID	ID	NA	8.4E+6 ug/m ³ (GG)	ID	ID	ID	ID	ID	ID
Methanol	67561	NA	74,000	2.0E+5	1.2E+7 (C)	6.7E+7 (C)	3.7E+7	4.6E+7	9.7E+7	9.6E+10	3.6E+8 (C)	3.1E+6
Methoxychlor	72435	NA	16,000	16,000	NA	ID	ID	ID	ID	ID	5.6E+6	NA
2-Methoxyethanol (I)	109864	NA	150	420	NA	NLV	NLV	NLV	NLV	5.9E+8	7.3E+5	1.1E+8
2-Methyl-4-chlorophenoxyacetic acid	94746	NA	390	1,100	NA	NLV	NLV	NLV	NLV	ID	7.3E+5	NA
2-Methyl-4,6-dinitrophenol	534521	NA	830 (M); 400	830 (M); 400	NA	NLV	NLV	NLV	NLV	5.9E+7	2.6E+5	NA

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			Residential Drinking Water Protection Criteria & RBSLs	Nonresidential Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
N-Methyl-morpholine (I)	109024	NA	400	1,100	NA	NLV	NLV	NLV	NLV	ID	2.0E+6	1.1E+8
Methyl parathion	298000	NA	46	130	NA	NLV	NLV	NLV	NLV	ID	1.8E+5	NA
4-Methyl-2-pentanone (MIBK) (I)	108101	NA	36,000	1.0E+5	ID	6.9E+7 (C)	5.3E+7	5.3E+7	7.0E+7	6.0E+10	1.8E+8 (C)	2.7E+6
Methyl-tert-butyl ether (MTBE)	1634044	NA	800	800	1.4E+5 (X)	1.8E+7 (C)	3.0E+7	4.1E+7	8.9E+7	8.8E+10	7.1E+6 (C)	5.9E+6
Methylcyclopentane (I)	96377	NA	ID	ID	NA	1.7E+5	2.8E+6	8.3E+6	2.0E+7	2.1E+10	ID	3.5E+5
4,4'-Methylene-bis-2-chloroaniline	101144	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	1.1E+8	32,000	NA
Methylene chloride	75092	NA	100	100	30,000 (X)	2.4E+5	7.0E+5	1.7E+6	4.0E+6	8.3E+9	5.8E+6 (C)	2.3E+6
2-Methylnaphthalene	91576	NA	57,000	1.7E+5	4,200	4.9E+6	1.8E+6	1.8E+6	1.8E+6	2.9E+8	2.6E+7	NA
Methylphenols (J)	1319773	NA	7,400	20,000	1,000 (M); 600	NLV	NLV	NLV	NLV	2.9E+9	3.6E+7	NA
Metolachlor	51218452	NA	4,800	20,000	300	NLV	NLV	NLV	NLV	ID	6.9E+6 (C,DD)	4.4E+5
Metribuzin	21087649	NA	3,600	10,000	NA	ID	ID	ID	ID	ID	2.8E+7	NA
Mirex	2385855	NA	NLL	NLL	NLL	ID	ID	ID	ID	ID	40,000	NA
Molybdenum (B)	7439987	NA	1,500	4,200	64,000 (X)	NLV	NLV	NLV	NLV	ID	9.6E+6	NA
Naphthalene	91203	NA	35,000	1.0E+5	730	4.7E+5	3.5E+5	3.5E+5	3.5E+5	8.8E+7	5.2E+7	NA
Nickel (B)	7440020	20,000	1.0E+5	1.0E+5	(G)	NLV	NLV	NLV	NLV	1.6E+7	1.5E+8	NA
Nitrate (B,N)	14797558	NA	2.0E+5 (N)	2.0E+5 (N)	ID	NLV	NLV	NLV	NLV	ID	ID	NA
Nitrite (B,N)	14797650	NA	20,000 (N)	20,000 (N)	NA	NLV	NLV	NLV	NLV	ID	ID	NA
Nitrobenzene (I)	98953	NA	330 (M); 68	330 (M); 190	3,600 (X)	1.7E+5	64,000	64,000	64,000	2.1E+7	3.4E+5	4.9E+5
2-Nitrophenol	88755	NA	400	1,200	ID	NLV	NLV	NLV	NLV	ID	2.0E+6	NA
n-Nitroso-di-n-propylamine	621647	NA	330 (M); 100	330 (M); 100	NA	NLV	NLV	NLV	NLV	2.0E+6	5,400	1.5E+6
N-Nitrosodiphenylamine	86306	NA	5,400	22,000	NA	NLV	NLV	NLV	NLV	2.8E+9	7.8E+6	NA
Oxamyl	23135220	NA	4,000	4,000	NA	NLV	NLV	NLV	NLV	ID	2.8E+7	NA
Oxo-hexyl acetate	88230357	NA	1,500	4,200	NA	ID	ID	ID	ID	2.4E+9	7.3E+6	1.0E+7
Pendimethalin	40487421	NA	1.1E+6	1.1E+6	NA	NLV	NLV	NLV	NLV	ID	1.3E+8	NA
Pentachlorobenzene	608935	NA	29,000	81,000	9,500	ID	ID	ID	ID	ID	9.3E+5 (C)	1.9E+5
Pentachloronitrobenzene	82688	NA	37,000	37,000	NA	2.2E+5	2.8E+5	2.8E+5	2.8E+5	1.5E+8	5.5E+6	NA

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Pentachlorophenol	87865	NA	22	22	(G,X)	NLV	NLV	NLV	NLV	1.3E+8	3.2E+5	NA
Pentane	109660	NA	ID	ID	NA	1.8E+5	4.4E+7	3.4E+8	6.0E+8	5.3E+11	ID	2.4E+5
2-Pentene (I)	109682	NA	ID	ID	NA	ID	ID	ID	ID	ID	ID	2.2E+5
Phenanthrene	85018	NA	56,000	1.6E+5	2,100	5.1E+6	1.9E+5	1.9E+5	1.9E+5	2.9E+6	5.2E+6	NA
Phenol	108952	NA	88,000	2.6E+5	9,000	NLV	NLV	NLV	NLV	1.8E+10	2.3E+8 (C,DD)	1.2E+7
Phenytion	57410	NA	830	3300	4300 (X)	NLV	NLV	NLV	NLV	2.8E+8	4.8E+5	NA
Phosphorus (Total)	7723140	NA	1.3E+6	4.8E+6	(EE)	NLV	NLV	NLV	NLV	2.9E+7	1.0E+9 (D)	NA
Phthalic acid	88993	NA	2.8E+5	8.0E+5	NA	NLV	NLV	NLV	NLV	ID	1.0E+9 (C,D)	1.7E+6
Phthalic anhydride	85449	NA	3.0E+5	8.8E+5	NA	NLV	NLV	NLV	NLV	ID	1.0E+9 (C,D)	1.1E+6
Picloram	1918021	NA	10,000	10,000	920	NLV	NLV	NLV	NLV	ID	5.1E+7	NA
Piperidine	110894	NA	64	180	NA	NLV	NLV	NLV	NLV	4.1E+9	3.2E+5	1.2E+8
Polybrominated biphenyls (J)	67774327	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	4,800	NA
Polychlorinated biphenyls (PCBs) (J,T)	1336363	NA	NLL	NLL	NLL	1.6E+7	8.1E+5	2.8E+7	2.8E+7	6.5E+6	(T)	NA
Prometon	1610180	NA	4,900	14,000	NA	NLV	NLV	NLV	NLV	ID	1.6E+7	NA
Propachlor	1918167	NA	1,900	5,400	NA	NLV	NLV	NLV	NLV	ID	9.5E+6	NA
Propazine	139402	NA	4,000	11,000	NA	NLV	NLV	NLV	NLV	ID	2.0E+7	NA
Propionic acid	79094	NA	2.4E+5	7.0E+5	ID	NLV	NLV	NLV	NLV	8.8E+9	1.0E+9 (C,D)	1.1E+8
Propyl alcohol (I)	71238	NA	28,000	80,000	NA	NLV	NLV	NLV	NLV	2.1E+10	7.4E+7 (DD)	1.1E+8
n-Propylbenzene (I)	103651	NA	1,600	4,600	ID	ID	ID	ID	ID	5.9E+8	8.0E+6	1.0E+7
Propylene glycol	57556	NA	3.0E+6	8.4E+6	5.8E+6	NLV	NLV	NLV	NLV	1.8E+11	1.0E+9 (C,D)	1.1E+8
Pyrene	129000	NA	4.8E+5	4.8E+5	ID	1.0E+9 (D)	7.8E+8	7.8E+8	7.8E+8	2.9E+9	8.4E+7	NA
Pyridine (I)	110861	NA	400	420	NA	2,000	9,800	40,000	97,000	1.0E+8	7.3E+5 (C)	37,000
Selenium (B)	7782492	410	4,000	4,000	400	NLV	NLV	NLV	NLV	5.9E+7	9.6E+6	NA
Silver (B)	7440224	1,000	4,500	13,000	100 (M); 27	NLV	NLV	NLV	NLV	2.9E+6	9.0E+6	NA
Silvex (2,4,5-TP)	93721	NA	3,600	3,600	2,200	NLV	NLV	NLV	NLV	ID	5.5E+6	NA

Simazine	122349	NA	80	80	340	NLV	NLV	NLV	NLV	ID	3.8E+6	NA
Sodium	17341252	NA	4.6E+6	7.0E+6	NA	NLV	NLV	NLV	NLV	ID	1.0E+9 (D)	NA

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Sodium azide	26628228	NA	1,800	5,000	1,000	ID	ID	ID	ID	ID	8.7E+6	NA
Strontium (B)	7440246	NA	92,000	2.6E+5	4.2E+5	NLV	NLV	NLV	NLV	ID	1.0E+9 (D)	NA
Styrene	100425	NA	2,700	2,700	2,100 (X)	1.3E+6 (C)	3.3E+6	3.3E+6	4.2E+6	6.9E+9	1.9E+6 (C)	5.2E+5
Sulfate	14808798	NA	5.0E+6	5.0E+6	NA	NLV	NLV	NLV	NLV	ID	ID	NA
Tebuthiuron	34014181	NA	10,000	30,000	NA	NLV	NLV	NLV	NLV	ID	2.7E+7 (DD)	NA
2,3,7,8-Tetrabromodibenzo-p-dioxin (O)	50585416	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	(O)	(O)	NA
1,2,4,5-Tetrachlorobenzene	95943	NA	1.5E+6	1.5E+6	3,400 (X)	1.1E+6	2.7E+5	2.7E+5	2.7E+5	2.9E+7	2.5E+8	NA
2,3,7,8-Tetrachlorodibenzo-p-dioxin (O)	1746016	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	59 (O)	0.99 (O)	NA
1,1,1,2-Tetrachloroethane	630206	NA	1,500	6,400	ID	33,000	1.2E+5	2.1E+5	3.3E+5	5.3E+8	2.2E+6 (C)	4.4E+5
1,1,2,2-Tetrachloroethane	79345	NA	170	700	1,600 (X)	23,000	34,000	34,000	34,000	6.8E+7	2.4E+5	8.7E+5
Tetrachloroethylene	127184	NA	100	100	1,200 (X)	21,000	2.1E+5	4.9E+5	1.1E+6	1.2E+9	9.3E+5 (C)	88,000
Tetrahydrofuran	109999	NA	1,900	5,400	2.2E+5 (X)	2.4E+6	1.5E+7	6.7E+7	1.6E+8	1.7E+11	9.5E+6	1.2E+8
Tetranitromethane	509148	NA	ID	ID	NA	600	500 (M); 180	ID	ID	2.6E+5	ID	ID
Thallium (B)	7440280	NA	2,300	2,300	4,200 (X)	NLV	NLV	NLV	NLV	5.9E+6	1.3E+5	NA
Toluene (I)	108883	NA	16,000	16,000	5,400	6.1E+5 (C)	3.3E+6	3.6E+7	3.6E+7	1.2E+10	1.6E+8 (C)	2.5E+5
p-Toluidine	106490	NA	660 (M); 300	1,200	NA	NLV	NLV	NLV	NLV	1.3E+8	4.3E+5	1.2E+6
Toxaphene	8001352	NA	24,000	24,000	8,200	NLV	NLV	NLV	NLV	1.2E+7	85,000	NA
Triallate	2303175	NA	95,000	2.7E+5 (C)	NA	ID	ID	ID	ID	ID	9.5E+6 (C)	2.5E+5
Tributylamine	102829	NA	7,800	23,000	ID	1.1E+6	7.2E+5	7.2E+5	7.2E+5	2.1E+8	2.6E+6	3.7E+6
1,2,4-Trichlorobenzene	120821	NA	4,200	4,200	5,900 (X)	1.8E+7 (C)	3.4E+7	3.4E+7	3.4E+7	1.1E+10	5.8E+6 (C,DD)	1.1E+6
1,1,1-Trichloroethane	71556	NA	4,000	4,000	1,800	4.6E+5	4.5E+6	1.5E+7	3.1E+7	2.9E+10	1.0E+9 (C,D)	4.6E+5
1,1,2-Trichloroethane	79005	NA	100	100	6,600 (X)	24,000	57,000	57,000	1.2E+5	2.5E+8	8.4E+5	9.2E+5

Trichloroethylene	79016	NA	100	100	4,000 (X)	1,900	14,000	25,000	58,000	5.9E+7	6.6E+5 (C,DD)	5.0E+5
Trichlorofluoromethane	75694	NA	52,000	1.5E+5	NA	5.1E+6(C)	1.1E+8	1.4E+11	1.4E+11	1.7E+12	2.6E+8 (C)	5.6E+5
2,4,5-Trichlorophenol	95954	NA	39,000	1.1E+5	NA	NLV	NLV	NLV	NLV	1.0E+10	7.3E+7	NA
2,4,6-Trichlorophenol	88062	NA	2,400	9,400	330 (M); 100	NLV	NLV	NLV	NLV	1.3E+9	3.3E+6	NA

**TABLE 3. SOIL: NONRESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS;**

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to 1 microgram per kilogram (ug/kg). Criteria with 6 or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (§324.20120a(10)). In these cases, 2 numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value.

Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Groundwater Protection			Indoor Air	Ambient Air (Y) (C)				Contact	Csat
			Residential Drinking Water Protection Criteria & RBSLs	Nonresidential Drinking Water Protection Criteria & RBSLs	Groundwater Surface Water Interface Protection Criteria & RBSLs	Soil Volatilization to Indoor Air Inhalation Criteria & RBSLs	Infinite Source Volatile Soil Inhalation Criteria (VSIC) & RBSLs	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria & RBSLs	Direct Contact Criteria & RBSLs	Soil Saturation Concentration Screening Levels
1,2,3-Trichloropropane	96184	NA	840	2,400	NA	7,500	11,000	11,000	12,000	8.8E+6	4.2E+6 (C)	8.3E+5
1,1,2-Trichloro-1,2,2-trifluoroethane	76131	NA	9.0E+6 (C)	9.0E+6 (C)	1,700	9.3E+6 (C)	2.1E+8	8.9E+8	2.1E+9	2.3E+12	1.0E+9 (C,D)	5.5E+5
Triethanolamine	102716	NA	74,000	2.0E+5	NA	NLV	NLV	NLV	NLV	1.5E+9	3.6E+8 (C)	1.1E+8
Triethylene glycol	112276	NA	86,000	2.4E+5 (C)	NA	NLV	NLV	NLV	NLV	ID	2.3E+8 (C,DD)	1.1E+5
3-Trifluoromethyl-4-nitrophenol	88302	NA	1.1E+5	3.1E+5	NA	NLV	NLV	NLV	NLV	ID	2.4E+8 (DD)	NA
Trifluralin	1582098	NA	1.9E+5	5.7E+5	NA	ID	ID	ID	ID	ID	5.7E+6	NA
2,2,4-Trimethyl pentane	540841	NA	ID	ID	NA	2.0E+5 (C)	6.3E+6	4.0E+7	9.6E+7	1.0E+11	ID	19,000
2,4,4-Trimethyl-2-pentene (I)	107404	NA	ID	ID	NA	ID	ID	ID	ID	ID	ID	56,000
1,2,4-Trimethylbenzene (I)	95636	NA	2,100	2,100	570	8.0E+6 (C)	2.5E+7	6.0E+8	6.0E+8	3.6E+10	1.0E+8 (C)	1.1E+5
1,3,5-Trimethylbenzene (I)	108678	NA	1,800	1,800	1,100	4.8E+6 (C)	1.9E+7	4.6E+8	4.6E+8	3.6E+10	1.0E+8 (C)	94,000
Triphenyl phosphate	115866	NA	1.5E+6 (C)	1.8E+6 (C)	NA	NLV	NLV	NLV	NLV	ID	1.2E+8 (C)	1.1E+5
tris(2,3-Dibromopropyl)phosphate	126727	NA	930	930	ID	4.3E+5 (C)	60,000	60,000	60,000	7.4E+6	20,000	27,000
Urea	57136	NA	ID	ID	NA	NLV	NLV	NLV	NLV	ID	ID	NA
Vanadium	7440622	NA	72,000	9.9E+5	4.3E+5	NLV	NLV	NLV	NLV	ID	5.5E+6 (DD)	NA
Vinyl acetate (I)	108054	NA	13,000	36,000	NA	1.5E+6	2.0E+6	2.7E+6	5.9E+6	5.9E+9	3.4E+7 (C,DD)	2.4E+6
Vinyl chloride	75014	NA	40	40	260 (X)	2,800	29,000	1.7E+5	4.2E+5	8.9E+8	34,000	4.9E+5
White phosphorus (R)	12185103	NA	2.2	6	NA	NLV	NLV	NLV	NLV	ID	17,000 (DD)	NA
Xylenes (I)	1330207	NA	5,600	5,600	820	1.2E+7 (C)	5.4E+7	6.5E+7	1.3E+8	1.3E+11	1.0E+9 (C,D)	1.5E+5
Zinc (B)	7440666	47,000	2.4E+6	5.0E+6	(G)	NLV	NLV	NLV	NLV	ID	6.3E+8	NA

R 299.49 Footnotes for generic cleanup criteria tables.

Rule 49. (1) The footnotes that apply to the generic criteria tables in R 299.44, R 299.46, and R 299.48 are as follows:

- (A) Criterion is the state of Michigan drinking water standard established pursuant to Section 5 of 1976 PA 399, MCL 325.1005.
- (B) Background, as defined in R 299.1(b), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.
- (C) The criterion developed under R 299.20 to R 299.26 exceeds the chemical-specific soil saturation screening level (C_{sat}). The person proposing or implementing response activity shall document whether additional response activity is required to control free-phase liquids or NAPL to protect against risks associated with free-phase liquids by using methods appropriate for the free-phase liquids present. Development of a site-specific C_{sat} or methods presented in R 299.22, R 299.24(5), and R 299.26(8) may be conducted for the relevant exposure pathways.
- (D) Calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).
- (E) Criterion is the aesthetic drinking water value, as required by Section 20120a(5) of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). A notice of aesthetic impact may be employed as an institutional control mechanism if groundwater concentrations exceed the aesthetic drinking water criterion, but do not exceed the applicable health-based drinking water value provided in the following table:

Hazardous Substance	Chemical Abstract Service Number	Residential Health-Based Drinking Water Value	Non-Residential Health-Based Drinking Water Value
Aluminum	7429905	300	4,100
tertiary Amyl methyl ether	994058	910	2,600
Copper	7440508	1,400	4,000
Diethyl ether	60297	3,700	10,000
Ethylbenzene	100414	700	700
Iron	7439896	2,000	5,600
Manganese	7439965	860	2,500
Methyl-tert-butyl ether (MTBE)	1634044	240	690
Toluene	108883	1,000	1,000
1,2,4-Trimethylbenzene	95636	1,000	2,900
1,3,5-Trimethylbenzene	108678	1,000	2,900
Xylenes	1330207	10,000	10,000

- (F) Criterion is based on adverse impacts to plant life and phytotoxicity.
- (G) Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness of the receiving surface water. Where water hardness exceeds 400 mg CaCO_3/L , use 400 mg CaCO_3/L for the FCV calculation. The FCV formula provides values in units of ug/L or ppb. The generic GSI criterion is the lesser of the calculated FCV, the wildlife value (WV), and the surface water human non-drinking water value (HNDV). The soil GSI protection criteria for these hazardous substances are the greater of the 20 times the GSI criterion or the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote.

Hazardous Substance	FCV Formula ug/L	FCV Conversion Factor (CF)	WV ug/L	HNDV ug/L
Acetate	$\text{EXP}(0.2732 * (\text{pH}) + 7.0362)$	NA	NA	1.3E+6
Acetic Acid	$\text{EXP}(0.2732 * (\text{pH}) + 7.0362)$	NA	NA	1.3E+6
Barium	$\text{EXP}(1.0629 * (\text{LnH}) + 1.1869)$	NA	NA	1.6E+5
Beryllium	$\text{EXP}(2.5279 * (\text{LnH}) - 10.7689)$	NA	NA	1,200
Cadmium [⊗]	$(\text{EXP}(0.7852 * (\text{LnH}) - 2.715)) * \text{CF}$	1.101672- $(\text{EXP}(0.7852 * (\text{LnH}) - 2.715)) * \text{CF}$	NA	130
Chromium (III) [⊗]	$(\text{EXP}(0.819 * (\text{LnH}) + 0.6848)) * \text{CF}$	0.86	NA	9,400
Copper	$(\text{EXP}(0.8545 * (\text{LnH}) - 1.702)) * \text{CF}$	0.96	NA	38,000
Lead [⊗]	$(\text{EXP}(0.9859 * (\text{LnH}) - 1.270)) * \text{CF}$	1.46203- $(\text{EXP}(0.9859 * (\text{LnH}) - 1.270)) * \text{CF}$	NA	190
Manganese [⊗]	$\text{EXP}(0.8784 * (\text{LnH}) + 3.5385)$	NA	NA	59,000
Nickel	$(\text{EXP}(0.846 * (\text{LnH}) + 0.0584)) * \text{CF}$	0.997	NA	2.1E+5
Pentachlorophenol [⊗]	$\text{EXP}(1.005 * (\text{pH}) - 5.134)$	NA	NA	2.8
Zinc	$(\text{EXP}(0.8473 * (\text{LnH}) + 0.884)) * \text{CF}$	0.986	NA	16,000

where,

EXP(x) = The base of the natural logarithm raised to power x (e^x).

LnH = The natural logarithm of water hardness in mg CaCO_3/L .

* = The multiplication symbol.

⊗ = The GSI criterion developed here may not be protective for surface water that is used as a drinking water source. Refer to footnote (X) for further guidance.

A spreadsheet that may be used to calculate GSI and GSI protection criteria for (G)-footnoted hazardous substances is available on the Department of Environmental Quality (DEQ) internet web site.

- (H) Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.
- (I) Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the DEQ, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401 (stock

number 869-044-00155-1), or from the DEQ, Remediation and Redevelopment Division (RRD), 525 West Allegan Street, Lansing, Michigan 48933, at cost.

- (J) Hazardous substance may be present in several isomer forms. Isomer-specific concentrations shall be added together for comparison to criteria.
- (K) Hazardous substance may be flammable or explosive, or both.
- (L) Criteria for lead are derived using a biologically based model, as allowed for under Section 20120a(9) of the NREPA, and are not calculated using the algorithms and assumptions specified in pathway-specific rules. The generic residential drinking water criterion of 4 ug/L is linked to the generic residential soil direct contact criterion of 400 mg/kg. A higher concentration in the drinking water, up to the state action level of 15 ug/L, may be allowed as a site-specific remedy and still allow for drinking water use, under Section 20120a(2) and 20120b of the NREPA if soil concentrations are appropriately lower than 400 mg/kg. If a site-specific criterion is approved based on this subdivision, a notice shall be filed on the deed for all property where the groundwater concentrations will exceed 4 ug/L to provide notice of the potential for unacceptable risk if soil or groundwater concentrations increase. Acceptable combinations of site-specific soil and drinking water concentrations are presented in the following table:

Acceptable Combinations of Lead in Drinking Water and Soil

Drinking Water Concentration (ug/L)	Soil Concentration (mg/kg)
5	386-395
6	376-385
7	376-385
8	366-375
9	356-365
10	346-355
11	336-345
12	336-345
13	326-335
14	316-325
15	306-315

- (M) Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.
- (N) The concentrations of all potential sources of nitrate-nitrogen (e.g., ammonia-N, nitrite-N, nitrate-N) in groundwater that is used as a source of drinking water shall not, when added together, exceed the nitrate drinking water criterion of 10,000 ug/L. Where leaching to groundwater is a relevant pathway, soil concentrations of all potential sources of nitrate-nitrogen shall not, when added together, exceed the nitrate drinking water protection criterion of 2.0E+5 ug/kg.
- (O) The concentration of all polychlorinated and polybrominated dibenzodioxin and dibenzofuran isomers present at a facility, expressed as an equivalent concentration of 2,3,7,8-tetrachlorodibenzo-p-dioxin based upon their relative potency, shall be added together and compared to the criteria for 2,3,7,8-tetrachlorodibenzo-p-dioxin. The generic cleanup criteria for 2,3,7,8-tetrachlorodibenzo-p-dioxin are not calculated according to the algorithms presented in R 299.14 to R 299.26. The generic cleanup criteria are being held at the values that the DEQ has used since August 1998, in recognition of the fact that national efforts to reassess risks posed by dioxin are not yet complete. Until these studies are complete, it is premature to select a revised slope factor and/or reference dose for calculation of generic cleanup criteria.
- (P) Amenable cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with all groundwater criteria. Total cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with soil criteria. Nonresidential direct contact criteria may not be protective of the potential for release of

hydrogen cyanide gas. Additional land or resource use restrictions may be necessary to protect for the acute inhalation concerns associated with hydrogen cyanide gas.

- (Q) Criteria for carcinogenic polycyclic aromatic hydrocarbons were developed using relative potential potencies to benzo(a)pyrene.
- (R) Hazardous substance may exhibit the characteristic of reactivity as defined in 40 C.F.R. §261.23 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the DEQ, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the DEQ, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost.
- (S) Criterion defaults to the hazardous substance-specific water solubility limit.
- (T) Refer to the federal Toxic Substances Control Act (TSCA), 40 C.F.R. §761, Subpart D and 40 C.F.R. §761, Subpart G, to determine the applicability of TSCA cleanup standards. Subpart D and Subpart G of 40 C.F.R. §761 (July 1, 2001) are adopted by reference in these rules and are available for inspection at the DEQ, 525 West Allegan Street, Lansing, Michigan. Copies of the regulations may be purchased, at a cost as of the time of adoption of these rules of \$55, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401, or from the DEQ, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost. Alternatives to compliance with the TSCA standards listed below are possible under 40 C.F.R. §761 Subpart D. New releases may be subject to the standards identified in 40 C.F.R. §761, Subpart G. Use Part 201 soil direct contact cleanup criteria in the following table if TSCA standards are not applicable.

Land Use Category	TSCA, Subpart D Cleanup Standards	Part 201 Soil Direct Contact Cleanup Criteria
Residential	1,000 ppb, or 10,000 ppb if capped	4,000 ppb
Nonresidential	1,000 ppb, or 10,000 ppb if capped	16,000 ppb

- (U) Hazardous substance may exhibit the characteristic of corrosivity as defined in 40 C.F.R. §261.22 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the DEQ, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of \$45, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the DEQ, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost.
- (V) Criterion is the aesthetic drinking water value as required by Section 20120(a)(5) of the NREPA. Concentrations up to 200 ug/L may be acceptable, and still allow for drinking water use, as part of a site-specific cleanup under Section 20120a(2) and 20120b of the NREPA.
- (W) Concentrations of trihalomethanes in groundwater shall be added together to determine compliance with the Michigan drinking water standard of 80 ug/L. Concentrations of trihalomethanes in soil shall be added together to determine compliance with the drinking water protection criterion of 1,600 ug/kg.

- (X) The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source. For a groundwater discharge to the Great Lakes and their connecting waters or discharge in close proximity to a water supply intake in inland surface waters, the generic GSI criterion shall be the surface water human drinking water value (HDV) listed in the table in this footnote, except for those HDV indicated with an asterisk. For HDV with an asterisk, the generic GSI criterion shall be the lowest of the HDV, the WV, and the calculated FCV. See formulas in footnote (G). Soil protection criteria based on the HDV shall be as listed in the table in this footnote, except for those values with an asterisk. Soil GSI protection criteria based on the HDV shall be as listed in the table in this footnote, except for those values with an asterisk. Soil GSI protection criteria for compounds with an asterisk shall be the greater of 20 times the GSI criterion or the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote.

Hazardous Substance	Chemical Abstract Service Number	Surface Water Human Drinking Water Values (HDV) (ug/L)	Soil GSI Protection Criteria for HDV (ug/kg)
Acrylamide	79061	0.5 (M); 0.12	10
Alachlor	15972608	3.5	88
Antimony	7440360	2.0 (M); 1.7	1,200
Benzene	71432	12	240
Boron	7440428	4,000	80,000
Bromate	15541454	10 (M); 0.5	200
n-Butanol	71363	3,500	70,000
Butyl benzyl phthalate	85687	6.9	13,000
Cadmium	7440439	2.5*	*
Carbon tetrachloride	56235	5.6	110
Chloride	16887006	50,000	1.0E+6
Chloroethane	75003	170	3,400
Chromium (III)	16065831	120*	*
Cyanazine	21725462	2.0 (M); 0.93	200 (M); 40
1,2-Dichloroethane	107062	6.0	120
trans-1,2-Dichloroethylene	156605	470	9,400
1,2-Dichloropropane	78875	9.1	180
1,3-Dichloropropene	542756	3.3	100 (M); 66
N,N-Dimethylacetamide	127195	700	14,000
1,4-Dioxane	123911	34	680
Ethylene dibromide	106934	0.17	20 (M); 3.4
Ethylene glycol	107211	56,000	1.1E+6
Hexachloroethane	67721	5.3	310
Isophorone	78591	310	6,200
Isopropyl alcohol	67630	28,000	5.6E+5
Lead	7439921	14*	*
Manganese	7439965	1,300*	*
Methanol	67561	14,000	2.8E+5
Methyl-tert-butyl ether (MTBE)	1634044	100	2,000
Methylene chloride	75092	47	940
Molybdenum	7439987	120	2,400
Nitrobenzene	98953	4.7	330 (M); 94
Pentachlorophenol	87865	1.8*	*
Styrene	100425	20	530
1,2,4,5-Tetrachlorobenzene	95943	2.8	3,300
1,1,2,2-Tetrachloroethane	79345	3.2	64

Hazardous Substance	Chemical Abstract Service Number	Surface Water Human Drinking Water Values (HDV) (ug/L)	Soil GSI Protection Criteria for HDV (ug/kg)
Tetrachloroethylene	127184	11	220
Tetrahydrofuran	109999	350	7,000
Thallium	7440280	2.0 (M); 1.2	1,400
1,2,4-Trichlorobenzene	120821	80	4,700
1,1,2-Trichloroethane	79005	12	240
Trichloroethylene	79016	29	580
Vinyl chloride	75014	1.0 (M); 0.25	40 (M); 20

- (Y) Source size modifiers shown in the following table shall be used to determine soil inhalation criteria for ambient air when the source size is not one-half acre. The modifier shall be multiplied by the generic soil inhalation criteria shown in the table of generic cleanup criteria to determine the applicable criterion. See Footnote (C).

Source Size sq. feet or acres	Modifier
400 sq feet	3.17
1000 sq feet	2.2
2000 sq feet	1.76
1/4 acre	1.15
1/2 acre	1
1 acre	0.87
2 acre	0.77
5 acre	0.66
10 acre	0.6
32 acre	0.5
100 acre	0.43

- (Z) Mercury is typically measured as total mercury. The generic cleanup criteria, however, are based on data for different species of mercury. Specifically, data for elemental mercury, chemical abstract service (CAS) number 7439976, serve as the basis for the soil volatilization to indoor air criteria, groundwater volatilization to indoor air, and soil inhalation criteria. Data for methyl mercury, CAS number 22967926, serve as the basis for the GSI criterion; and data for mercuric chloride, CAS number 7487947, serve as the basis for the drinking water, groundwater contact, soil direct contact, and the groundwater protection criteria. Comparison to criteria shall be based on species-specific analytical data only if sufficient facility characterization has been conducted to rule out the presence of other species of mercury.
- (AA) Use 10,000 ug/l where groundwater enters a structure through the use of a water well, sump or other device. Use 28,000 ug/l for all other uses.
- (BB) The state drinking water standard for asbestos (fibers greater than 10 micrometers in length) is in units of a million fibers per liter of water (MFL). Soil concentrations of asbestos are determined by polarized light microscopy.
- (CC) Groundwater: The generic GSI criteria are based on the toxicity of unionized ammonia (NH₃); the criteria are 29 ug/L and 53 ug/L for cold water and warm water surface water, respectively. As a result, the GSI criterion shall be compared to the percent of the total ammonia concentration in the groundwater that will

become NH_3 in the surface water. This percent NH_3 is a function of the pH and temperature of the receiving surface water and can be estimated using the following table, taken from Emerson, et al., (Journal of the Fisheries Research Board of Canada, Volume 32(12):2382, 1975).

Percent NH_3 in Aqueous Ammonia Solutions for 0-30 °C and pH 6-10

Temp (°F)	Temp (°C)	pH								
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
32.0	0	0.0082	0.026	0.082	0.26	0.82	2.5	7.6	20.	45.
		7	1	6	1	0	5	4	7	3
33.8	1	0.0089	0.028	0.089	0.28	0.89	2.7	8.2	22.	47.
		9	4	8	4	1	7	5	1	3
35.6	2	0.0097	0.030	0.097	0.30	0.96	3.0	8.9	23.	49.
		7	9	7	8	8	0	0	6	4
37.4	3	0.0106	0.033	0.106	0.33	1.05	3.2	9.6	25.	51.
			6		5		5	0	1	5
39.2	4	0.0115	0.036	0.115	0.36	1.14	3.5	10.	26.	53.
			4		3		2	3	7	5
41.0	5	0.0125	0.039	0.125	0.39	1.23	3.8	11.	28.	55.
			5		4		0	1	3	6
42.8	6	0.0136	0.042	0.135	0.42	1.34	4.1	11.	30.	57.
			9		7		1	9	0	6
44.6	7	0.0147	0.046	0.147	0.46	1.45	4.4	12.	31.	59.
			4		2		4	8	7	5
46.4	8	0.0159	0.050	0.159	0.50	1.57	4.7	13.	33.	61.
			3		1		9	7	5	4
48.2	9	0.0172	0.054	0.172	0.54	1.69	5.1	14.	35.	63.
			4		2		6	7	3	3
50.0	10	0.0186	0.058	0.186	0.58	1.83	5.5	15.	37.	65.
			9		6		6	7	1	1
51.8	11	0.0201	0.063	0.201	0.63	1.97	5.9	16.	38.	66.
			7		3		9	8	9	8
53.6	12	0.0218	0.068	0.217	0.68	2.13	6.4	17.	40.	68.
			8		4		4	9	8	5
55.4	13	0.0235	0.074	0.235	0.73	2.30	6.9	19.	42.	70.
			3		8		2	0	6	2
57.2	14	0.0254	0.080	0.253	0.79	2.48	7.4	20.	44.	71.
			2		6		3	2	5	7
59.0	15	0.0274	0.086	0.273	0.85	2.67	7.9	21.	46.	73.
			5		9		7	5	4	3
60.8	16	0.0295	0.093	0.294	0.92	2.87	8.5	22.	48.	74.
			3		5		4	8	3	7

62.6	17	0.0318	0.101	0.317	0.99	3.08	9.1	24.	50.	76.
					6		4	1	2	1
64.4	18	0.0343	0.108	0.342	1.07	3.31	9.7	25.	52.	77.
							8	5	0	4
66.2	19	0.0369	0.117	0.368	1.15	3.56	10.	27.	53.	78.
							5	0	9	7
68.0	20	0.0397	0.125	0.396	1.24	3.82	11.	28.	55.	79.
							2	4	7	9
69.8	21	0.0427	0.135	0.425	1.33	4.10	11.	29.	57.	81.
							9	9	5	0
71.6	22	0.0459	0.145	0.457	1.43	4.39	12.	31.	59.	82.
							7	5	2	1
73.4	23	0.0493	0.156	0.491	1.54	4.70	13.	33.	60.	83.
							5	0	9	2
75.2	24	0.0530	0.167	0.527	1.65	5.03	14.	34.	62.	84.
							4	6	6	1
77.0	25	0.0569	0.180	0.566	1.77	5.38	15.	36.	64.	85.
							3	3	3	1
78.8	26	0.0610	0.193	0.607	1.89	5.75	16.	37.	65.	85.
							2	9	9	9
80.6	27	0.0654	0.207	0.651	2.03	6.15	17.	39.	67.	86.
							2	6	4	8
82.4	28	0.0701	0.221	0.697	2.17	6.56	18.	41.	68.	87.
							2	2	9	3
84.2	29	0.0752	0.237	0.747	2.32	7.00	19.	42.	70.	88.
							2	9	4	3
86.0	30	0.0805	0.254	0.799	2.48	7.46	20.	44.	71.	89.
							3	6	8	0

The generic approach for estimating NH_3 assumes a default pH of 8 and default temperatures of 68°F and 85°F for cold water and warm water surface water, respectively. The resulting percent NH_3 is 3.8 percent and 7.2 percent for cold water and warm water, respectively. This default percentage shall be multiplied by the total ammonia-nitrogen ($\text{NH}_3\text{-N}$) concentration in the groundwater and the resulting NH_3 concentration compared to the applicable GSI criterion. As an alternative, the maximum pH and temperature data from the specific receiving surface water can be used to estimate, from the table in this footnote, a lower percent unionized ammonia concentration for comparison to the generic GSI.

Soil: The generic soil GSI protection criteria for unionized ammonia are 580 ug/kg and 1,100 ug/kg for cold water and warm water surface water, respectively.

- (DD) Hazardous substance causes developmental effects. Residential direct contact criteria are protective of both prenatal and postnatal exposure. Nonresidential direct contact criteria are protective for a pregnant adult receptor.
- (EE) The following are applicable generic GSI criteria as required by Section 20120e of the NREPA.

Hazardous Substance	GSI (ug/L)	Notes
Phosphorus	1,000	Criteria applicable unless receiving water is a surface water that has a phosphorus waste load allocation or is an inland lake. In those cases, contact the department for applicable values.
Total dissolved solids (TDS)	5.0E+5	If TDS data are not available, the TDS criterion may be used a screening level for the sum of the concentrations of the following substances: calcium, chlorides, iron, magnesium, POTASSIUM, SODIUM, SULFATE.

Dissolved Oxygen (DO): Cold receiving waters Warm receiving waters	$\geq 7,000$ $\geq 5,000$	Since a low level of DO can be harmful to aquatic life, the criterion represents a minimum level that on-site samples must exceed. This is in contrast to other criteria which represent “not to exceed” concentrations. DO criteria are not applicable if groundwater Carbonaceous Biochemical Oxygen Demand (CBOD) is less than 10,000 ug/L and groundwater ammonia concentration is less than 2,000 ug/L.
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- (FF) The chloride GSI criterion shall be 125 mg/l when the discharge is to surface waters of the state designated as public water supply sources or 50 mg/l when the discharge is to the Great Lakes or connecting waters. Chloride GSI criteria shall not apply for surface waters of the state that are not designated as a public water supply source, however, the total dissolved solids criterion is applicable.
- (GG) Risk-based criteria are not available for methane due to insufficient toxicity data. An acceptable soil gas concentration (presented for both residential and nonresidential land uses) was derived utilizing 25 percent of the lower explosive level for methane. This equates to 1.25 percent or $8.4E+6$ ug/m³.
- (HH) The residential criterion for sodium is 230,000 ug/l in accordance with the Sodium Advisory Council recommendation and revised Groundwater Discharge Standards.

“ID” means insufficient data to develop criterion.

“NA” means a criterion or value is not available or, in the case of background and CAS numbers, not applicable.

“NLL” means hazardous substance is not likely to leach under most soil conditions.

“NLV” means hazardous substance is not likely to volatilize under most conditions.

R 299.50 Toxicological and chemical-physical properties.

Rule 50. (1) The toxicological and chemical-physical properties used to calculate generic shall be as shown in table 4, except as provided in section 20120a(9) of the act, R 299.49(1)(l) and R 299.49(1)(o).

(2) Abbreviations used in table 4 have the following meanings when used in this rule:

(a) “NA” means not available.

(b) “NR” means not relevant.

TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA FOR
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS

Scientific notation is represented by E+ or E- a value, for example 200,000 is presented as 2.0E+5. Units are as indicated in each column heading. The dataset for each hazardous substance requires 22 columns across two pages. Review all 22 columns when evaluating data for a specific hazardous substance.

Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose	Oral Slope Factor	Chronic Inhalation Reference Concentration	Inhalation Unit Risk Factor	Occupational Short Term Exposure Level	Relative Source Contribution for Drinking Water	Ingestion Absorption Efficiency	Dermal Absorption Efficiency	Relative Source Contribution for Soil	Log Octanol-Water Partition Coefficient	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds
		RfD	SF	RfC	IURF	STEL	RSC	AEi	AEd	RSC	Log Kow	Koc
		mg/kg-day	(mg/kg-day) ⁻¹	ug/m ³	(ug/m ³) ⁻¹	ug/m ³	unitless	unitless	unitless	unitless	unitless	L/kg
Acenaphthene	83329	1.80E-01	NA	2.10E+02	NA	NA	0.2	1	0.1	1	3.92	7,140
Acenaphthylene	208968	7.10E-03	NA	3.50E+01	NA	NA	0.2	1	0.1	1	3.6	3,460
Acetaldehyde (I)	75070	1.30E-01	NA	9.00E+00	2.20E-06	4.50E+04	0.2	1	0.1	1	-0.367	0.613
Acetate	71501	5.70E-01	NA	NA	NA	NA	0.2	NA	NA	NA	NA	NA
Acetic acid	64197	5.70E-01	NA	2.50E+02	NA	3.70E+04	0.2	1	0.1	1	-0.23	0.595
Acetone (I)	67641	1.00E-01	NA	5.90E+03	NA	1.70E+06	0.2	1	0.1	1	-0.24	0.581
Acetonitrile	75058	1.90E-02	NA	6.00E+01	NA	1.01E+05	0.2	1	0.1	1	-0.337	0.648
Acetophenone	98862	2.10E-01	NA	4.90E+02	NA	NA	0.2	1	0.1	1	1.6	37.4
Acrolein (I)	107028	1.60E-02	NA	2.00E-02	NA	6.90E+02	0.2	1	0.1	1	-0.01	1.18
Acrylamide	79061	2.00E-04	2.80E+00	6	1.30E-03	NA	0.2	1	0.1	1	-0.96	0.114
Acrylic acid	79107	5.30E-01	NA	1.00E+00	NA	NA	0.2	1	0.1	1	0.35	2.21
Acrylonitrile (I)	107131	NA	3.30E-01	2.00E+00	6.80E-05	NA	0.2	1	0.1	1	0.255	1.78
Alachlor	15972608	1.00E-02	9.60E-02	NA	NA	NA	0.2	0.5	0.1	1	3.52	734
Aldicarb	116063	1.00E-03	NA	NA	NA	NA	0.2	1	0.1	1	1.1	12.1
Aldicarb sulfone	1646884	1.10E-03	NA	NA	NA	NA	0.2	1	0.1	1	-0.57	0.275
Aldicarb sulfoxide	1646873	1.30E-03	NA	NA	NA	NA	0.2	1	0.1	1	-0.67	0.22
Aldrin	309002	2.50E-05	8.70E+00	NA	4.90E-03	NA	0.2	0.5	0.1	1	6.5	2.45E+06
Aluminum (B)	7429905	3.30E-01	NA	NA	NA	NA	0.2	0.5	0.01	1	NR	NR
Ammonia	7664417	NA	NA	1.00E+02	NA	2.40E+04	0.2	1	0.1	1	NA	NA
t-Amyl methyl ether (TAME)	994058	1.30E-01	NA	6.20E+01	NA	NA	0.2	1	0.1	1	1.73	28.1
Aniline	62533	NA	1.60E-02	1.00E+00	1.60E-06	NA	0.2	1	0.1	1	0.978	9.15
Anthracene	120127	1.00E+00	NA	1.00E+03	NA	NA	0.2	1	0.1	1	4.55	29,700
Antimony	7440360	3.50E-04	NA	2.00E-01	NA	NA	0.2	0.5	0.01	1	NR	NR
Arsenic	7440382	2.70E-04	1.50E+00	NA	4.30E-03	NA	0.2	0.5	0.03	1	NR	NR
Asbestos (BB)	1332214	NA	NA	NA	4.60E-02	NA	1	1	0	1	NR	NR

Atrazine	1912249	3.50E-02	7.40E-02	NA	NA	NA	0.2	1	0.1	1	2.7	451
Azobenzene	103333	NA	3.70E-02	NA	3.10E-05	NA	0.2	1	0.1	1	3.82	5,690
Barium (B)	7440393	7.00E-02	NA	5.00E+00	NA	NA	1	0.5	0.01	1	NR	NR

TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS

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Hazardous Substance	Chemical Abstract Service Number	Soil Koc for Ionizing Organic Compounds at pH=6.8	Soil-Water Distribution Coefficients for Inorganic Compounds at pH=6.8	Henry's Law Constant at 25°C	Air Diffusivity	Water Diffusivity	Lower Explosive Limit in Air	Flash Point	Water Solubility	Physical State at Standard Temperature and Pressure	Molecular Weight
			Kd	HLC	D _i or D _s or D ^{air}	D _w	LEL	FP	S		MW
		L/kg	L/kg	atm-m ³ /mol	cm ² /s	cm ² /s	unitless	°F	ug/L	unitless	g/mol
Acenaphthene	83329	NR	NR	1.55E-04	0.0421	7.69E-06	NA	NA	4,240	Solid	154.2
Acenaphthylene	208968	NR	NR	1.48E-03	0.08	8.00E-06	NA	NA	3,930	Solid	152.271
Acetaldehyde (I)	75070	NR	NR	7.95E-05	0.08	8.00E-06	0.04	-36	1.00E+09	Liquid	44.1
Acetate	71501	NA	NA	NA	NA	NA	NA	NA	ID	NA	NA
Acetic acid	64197	NR	NR	1.00E-07	0.08	8.00E-06	0.04	103	6.00E+09	Liquid	60.05
Acetone (I)	67641	NR	NR	3.88E-05	0.124	1.14E-05	0.025	0	1.00E+09	Liquid	58.08
Acetonitrile	75058	NR	NR	2.40E-05	0.13	1.70E-05	0.03	42	2.00E+08	Liquid	41.05
Acetophenone	98862	NR	NR	1.10E-05	0.08	8.00E-06	NA	NA	6.10E+06	Liquid	120.2
Acrolein (I)	107028	NR	NR	9.40E-05	0.11	1.20E-05	0.028	-15	2.10E+08	Liquid	56.06
Acrylamide	79061	NR	NR	3.22E-10	0.097	1.10E-04	NA	280	2.20E+09	Solid	71.08
Acrylic acid	79107	NR	NR	3.20E-07	0.08	8.00E-06	0.024	121	1.00E+09	Liquid	72.06
Acrylonitrile (I)	107131	NR	NR	1.00E-04	0.12	1.30E-05	0.03	30	7.50E+07	Liquid	53.06
Alachlor	15972608	NR	NR	8.32E-09	0.08	8.00E-06	NA	NA	1.83E+05	Solid	269.77
Aldicarb	116063	NR	NR	4.17E-09	0.08	8.00E-06	NA	NA	6.00E+06	Solid	190.25
Aldicarb sulfone	1646884	NR	NR	3.37E-09	0.08	8.00E-06	NA	NA	7.80E+06	Solid	222.27
Aldicarb sulfoxide	1646873	NR	NR	9.69E-10	0.08	8.00E-06	NA	NA	2.80E+07	Solid	206.27
Aldrin	309002	NR	NR	1.70E-04	0.0132	4.86E-06	NA	NA	180	Solid	364.9
Aluminum (B)	7429905	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	26.982
Ammonia	7664417	NR	NR	3.20E-04	0.08	8.00E-06	0.15	NA	5.30E+08	Liquid	17.04
t-Amyl methyl ether (TAME)	994058	NR	NR	2.68E-03	0.08	8.00E-06	NA	NA	2.64E+06	Liquid	102.18
Aniline	62533	NR	NR	2.30E-06	0.07	8.30E-06	0.013	158	3.60E+07	Liquid	93.13
Anthracene	120127	NR	NR	6.50E-05	0.0324	7.74E-06	NA	NA	43.4	Solid	178.24

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Antimony	7440360	NR	45	NR	NR	NR	NA	NA	NA	Inorganic	121.76
Arsenic	7440382	NR	29	NR	NR	NR	NA	NA	NA	Inorganic	74.922
Asbestos (BB)	1332214	NR	NA	NR	NR	NR	NR	NR	NA	Inorganic	NA
Atrazine	1912249	NR	NR	2.63E-09	0.08	8.00E-06	NA	NA	70,000	Solid	215.72
Azobenzene	103333	NR	NR	1.35E-05	0.08	8.00E-06	NA	NA	6,400	Solid	182.23
Barium (B)	7440393	NR	41	NR	NR	NR	NA	NA	NA	Inorganic	137.327

TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA FOR PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS

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Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose	Oral Slope Factor	Chronic Inhalation Reference Concentration	Inhalation Unit Risk Factor	Occupational Short Term Exposure Level	Relative Source Contribution for Drinking Water	Ingestion Absorption Efficiency	Dermal Absorption Efficiency	Relative Source Contribution for Soil	Log Octanol-Water Partition Coefficient	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds
		RfD	SF	RfC	IURF	STEL	RSC	AEi	AEd	RSC	Log Kow	Koc
		mg/kg-day	(mg/kg-day) ⁻¹	ug/m ³	(ug/m ³) ⁻¹	ug/m ³	unitless	unitless	unitless	unitless	unitless	L/kg
Benzene (I)	71432	NA	2.90E-02	30	8.30E-06	8.00E+03	0.2	1	0.1	1	2.13	58.2
Benzidine	92875	2.70E-03	2.30E+02	NA	6.70E-02	NA	0.2	1	0.1	1	1.66	42.9
Benzo(a)anthracene (Q)	56553	NA	4.10E-01	NA	NA	NA	0.2	0.5	0.13	1	5.7	4.01E+05
Benzo(b)fluoranthene (Q)	205992	NA	4.10E-01	NA	NA	NA	0.2	0.5	0.13	1	6.2	1.24E+06
Benzo(k)fluoranthene (Q)	207089	NA	4.10E-02	NA	NA	NA	0.2	0.5	0.13	1	6.2	1.24E+06
Benzo(g,h,i)perylene	191242	7.10E-03	NA	1.20E+01	NA	NA	0.2	0.5	0.13	1	6.7	3.86E+06
Benzo(a)pyrene (Q)	50328	NA	4.10E+00	NA	2.10E-03	NA	0.2	0.5	0.13	1	6.11	1.01E+06
Benzoic acid	65850	4.40E+00	NA	NA	NA	NA	0.2	1	0.1	1	1.86	0.6
Benzyl alcohol	100516	1.40E+00	NA	5.00E+03	NA	NA	0.2	1	0.1	1	1.11	12.3
Benzyl chloride	100447	NA	1.10E-01	NA	5.00E-05	NA	0.2	1	0.1	1	2.3	182
Beryllium	7440417	1.50E-03	NA	2.00E-02	2.40E-03	1.00E+01	0.2	1	0	1	NR	NR
bis(2-Chloroethoxy)ethane	112265	NA	NA	NA	NA	NA	0.2	1	0.1	1	1.28	18.1
bis(2-Chloroethyl)ether (I)	111444	NA	4.20E-01	NA	3.30E-04	5.80E+04	0.2	1	0.1	1	1.21	10.9
bis(2-Ethylhexyl)phthalate	117817	1.90E-02	3.20E-03	NA	4.43E-06	1.00E+04	0.2	0.5	0.1	1	7.3	1.50E+07
Boron (B)	7440428	3.20E-01	NA	NA	NA	NA	0.2	0.5	0.01	1	NR	NR
Bromate	15541454	4.00E-03	7.00E-01	NA	NA	NA	0.2	0.5	0.01	1	0.63	NR
Bromobenzene (I)	108861	2.40E-03	NA	8.00E+00	NA	NA	0.2	1	0.1	1	2.99	870
Bromodichloromethane	75274	1.80E-02	5.00E-02	NA	3.70E-05	NA	0.2	1	0.1	1	2.1	55.1
Bromoform	75252	1.80E-02	6.40E-03	NA	1.10E-06	NA	0.2	1	0.1	1	2.35	87
Bromomethane	74839	1.40E-03	NA	5.00E+00	NA	NA	0.2	1	0.1	1	1.18	14.5
n-Butanol (I)	71363	1.30E-01	NA	3.50E+02	NA	1.52E+05	0.2	1	0.1	1	0.851	5.65
2-Butanone (MEK) (I)	78933	1.80E+00	NA	1.00E+03	NA	8.85E+05	0.2	1	0.1	1	0.279	1.99
n-Butyl acetate	123864	7.60E-02	NA	7.10E+03	NA	9.50E+05	0.2	1	0.1	1	1.78	30.8
t-Butyl alcohol	75650	5.40E-01	NA	1.89E+03	NA	NA	0.2	1	0.1	1	0.35	2.27
Butyl benzyl phthalate	85687	1.60E-01	NA	7.00E+02	NA	NA	0.2	1	0.1	1	4.84	57,300
n-Butylbenzene	104518	1.10E-02	NA	30	NA	NA	0.2	1	0.1	1	4.38	20,200

sec-Butylbenzene	135988	1.10E-02	NA	6.00E+00	NA	NA	0.2	1	0.1	1	4.57	31,100
t-Butylbenzene (I)	98066	1.10E-02	NA	10	NA	NA	0.2	1	0.1	1	4.11	11,000

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Hazardous Substance	Chemical Abstract Service Number	Soil Koc for Ionizing Organic Compounds at pH=6.8	Soil-Water Distribution Coefficients for Inorganic Compounds at pH=6.8	Henry's Law Constant at 25°C	Air Diffusivity	Water Diffusivity	Lower Explosive Limit in Air	Flash Point	Water Solubility	Physical State at Standard Temperature and Pressure	Molecular Weight
			Kd	HLC	D _i or D _a or D ^{air}	D _w	LEL	FP	S		MW
		L/kg	L/kg	atm-m ³ /mol	cm ² /s	cm ² /s	unitless	°F	ug/L	unitless	g/mol
Benzene (I)	71432	NR	NR	5.55E-03	0.088	9.80E-06	0.012	12	1.75E+06	Liquid	78.11
Benzidine	92875	NR	NR	3.90E-11	0.08	1.50E-05	NA	NA	5.20E+05	Solid	184.24
Benzo(a)anthracene (Q)	56553	NR	NR	3.35E-06	0.051	9.00E-06	NA	NA	9.4	Solid	228.3
Benzo(b)fluoranthene (Q)	205992	NR	NR	1.11E-04	0.0226	5.56E-06	NA	NA	1.5	Solid	252.32
Benzo(k)fluoranthene (Q)	207089	NR	NR	8.29E-07	0.0226	5.56E-06	NA	NA	0.8	Solid	252.32
Benzo(g,h,i)perylene	191242	NR	NR	5.34E-08	0.08	8.00E-06	NA	NA	0.26	Solid	276.34
Benzo(a)pyrene (Q)	50328	NR	NR	1.13E-06	0.043	9.00E-06	NA	NA	1.62	Solid	252.32
Benzoic acid	65850	0.6	NR	1.54E-06	0.0536	7.97E-06	NA	NA	3.50E+06	Solid	122.1
Benzyl alcohol	100516	NR	NR	3.90E-07	0.08	8.00E-06	NA	NA	4.40E+07	Liquid	108.13
Benzyl chloride	100447	NR	NR	4.00E-04	0.075	7.80E-06	0.011	153	4.90E+05	Liquid	126.58
Beryllium	7440417	NR	790	NR	NR	NR	NA	NA	NA	Inorganic	9.012
bis(2-Chloroethoxy)ethane	112265	NR	NR	7.81E-07	0.08	8.00E-06	NA	NA	1.89E+07	Liquid	187.07
bis(2-Chloroethyl)ether (I)	111444	NR	NR	1.80E-05	0.0692	7.53E-06	0.027	131	1.72E+07	Liquid	143.01
bis(2-Ethylhexyl)phthalate	117817	NR	NR	1.02E-07	0.0351	3.66E-06	NA	420	340	Liquid	390.57
Boron (B)	7440428	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	10.811
Bromate	15541454	NR	NA	1.00E+00	NR	NR	NA	NA	38,000	Solid	79.9
Bromobenzene (I)	108861	NR	NR	4.74E-04	0.08	8.00E-06	NA	NA	4.13E+05	Liquid	157.015
Bromodichloromethane	75274	NR	NR	1.60E-03	0.0298	1.06E-05	NA	NA	6.74E+06	Liquid	163.8
Bromoform	75252	NR	NR	5.35E-04	0.0149	1.03E-05	NA	NA	3.10E+06	Liquid	252.8
Bromomethane	74839	NR	NR	1.42E-02	0.08	8.00E-06	0.1	NA	1.45E+07	Liquid	94.94
n-Butanol (I)	71363	NR	NR	8.81E-06	0.08	9.60E-06	0.014	84	7.40E+07	Liquid	74.14
2-Butanone (MEK) (I)	78933	NR	NR	3.60E-05	0.081	9.80E-06	NA	16	2.40E+08	Liquid	72.1
n-Butyl acetate	123864	NR	NR	3.20E-04	0.08	8.00E-06	0.017	72	6.70E+06	Liquid	116.16

t-Butyl alcohol	75650	NR	NR	1.17E-05	0.08	8.00E-06	0.024	52	1.00E+09	Liquid	74.12
Butyl benzyl phthalate	85687	NR	NR	1.26E-06	0.0174	4.83E-06	NA	NA	2,690	Liquid	312.37
n-Butylbenzene	104518	NR	NR	NA	0.08	8.00E-06	NA	NA	NA	Liquid	134.22
sec-Butylbenzene	135988	NR	NR	NA	0.08	8.00E-06	NA	NA	NA	Liquid	134.22
t-Butylbenzene (I)	98066	NR	NR	NA	0.08	8.00E-06	NA	NA	NA	Liquid	134.22

TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA FOR
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS

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Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose	Oral Slope Factor	Chronic Inhalation Reference Concentration	Inhalation Unit Risk Factor	Occupational Short Term Exposure Level	Relative Source Contribution for Drinking Water	Ingestion Absorption Efficiency	Dermal Absorption Efficiency	Relative Source Contribution for Soil	Log Octanol-Water Partition Coefficient	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds
		RfD	SF	RfC	IURF	STEL	RSC	AEi	AEd	RSC	Log Kow	Koc
		mg/kg-day	(mg/kg-day) ⁻¹	ug/m ³	(ug/m ³) ⁻¹	ug/m ³	unitless	unitless	unitless	unitless	unitless	L/kg
Cadmium (B)	7440439	1.00E-03	NA	NA	1.80E-03	NA	0.2	0.5	0.001	1	NR	NR
Camphene (I)	79925	NA	NA	80	NA	NA	0.2	1	0.1	1	3.53	2,950
Caprolactam	105602	8.00E-01	NA	1.00E+01	NA	4.60E+04	0.2	1	0.1	1	-0.19	0.65
Carbaryl	63252	9.60E-02	NA	NA	NA	NA	0.2	1	0.1	1	2.4	229
Carbazole	86748	NA	1.00E-02	NA	5.00E-05	NA	0.2	1	0.1	1	3.59	3,380
Carbofuran	1563662	5.00E-03	NA	NA	NA	NA	0.2	1	0.1	1	1.6	37.4
Carbon disulfide (I,R)	75150	1.10E-01	NA	7.00E+02	NA	NA	0.2	1	0.1	1	2	45.9
Carbon tetrachloride	56235	7.10E-04	5.50E-02	100	2.36E-05	6.30E+04	0.2	1	0.1	1	2.73	174
Chlordane (J)	57749	1.50E-03	3.50E-01	7.00E-01	1.00E-04	NA	0.2	0.5	0.04	1	6.32	1.21E+05
Chloride	16887006	NA	NA	NA	NA	NA	0.2	0.5	0.01	1	NR	NR
Chlorobenzene (I)	108907	1.90E-02	NA	7.00E+01	NA	NA	0.2	1	0.1	1	2.86	220
p-Chlorobenzene sulfonic acid	98668	1.00E+00	NA	NA	NA	NA	0.2	1	0.1	1	-0.52	4.64E-01
1-Chloro-1,1-difluoroethane	75683	2.10E+00	NA	5.00E+04	NA	NA	0.2	1	0.1	1	1.81	32.5
Chloroethane	75003	1.80E+01	2.00E-03	1.00E+04	NA	NA	0.2	1	0.1	1	1.4	23.8
2-Chloroethyl vinyl ether	110758	NA	NA	NA	NA	NA	0.2	1	0.1	1	1.07	8.43
Chloroform	67663	1.30E-02	4.40E-03	NA	2.40E-06	NA	0.2	1	0.1	1	1.92	39.7
Chloromethane (I)	74873	NA	3.30E-03	9.00E+01	6.39E-07	2.07E+05	0.2	1	0.1	1	0.91	6.3
4-Chloro-3-methylphenol	59507	2.00E-02	NA	NA	NA	NA	0.2	1	0.1	1	3.1	1,120
beta-Chloronaphthalene	91587	2.50E-01	NA	NA	NA	NA	0.2	1	0.1	1	4.1	10,700
2-Chlorophenol	95578	6.20E-03	NA	1.80E+01	NA	NA	0.2	1	0.1	1	2.15	388

o-Chlorotoluene (I)	95498	2.00E-02	NA	7.00E+01	NA	NA	0.2	1	0.1	1	3.42	612
Chlorpyrifos	2921882	3.00E-02	NA	2.00E+00	NA	NA	0.2	0.5	0.1	1	5.3	18,900
Chromium (III) (B,H)	16065831	1.50E+00	NA	5.00E+00	NA	NA	0.7	0.5	0.01	1	NR	NR
Chromium (VI)	18540299	4.80E-03	NA	8.00E-03	1.20E-02	NA	0.7	0.5	0.01	1	NR	NR
Chrysene (Q)	218019	NA	4.10E-03	NA	NA	NA	0.2	0.5	0.13	1	5.7	4.01E+05
Cobalt	7440484	5.00E-03	NA	2.00E-01	NA	NA	0.2	0.5	0.01	1	NR	NR
Copper (B)	7440508	3.80E-02	NA	2.00E+00	NA	NA	1	0.5	0.01	1	NR	NR
Cyanazine	21725462	3.00E-03	3.70E-01	NA	NA	NA	0.2	1	0.1	1	2.2	146

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PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS

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Hazardous Substance	Chemical Abstract Service Number	Soil Koc for Ionizing Organic Compounds at pH=6.8	Soil-Water Distribution Coefficients for Inorganic Compounds at pH=6.8	Henry's Law Constant at 25°C	Air Diffusivity	Water Diffusivity	Lower Explosive Limit in Air	Flash Point	Water Solubility	Physical State at Standard Temperature and Pressure	Molecular Weight
			Kd	HLC	D _i or D _s or D ^{air}	D _w	LEL	FP	S		MW
		L/kg	L/kg	atm-m ³ /mol	cm ² /s	cm ² /s	unitless	°F	ug/L	unitless	g/mol
Cadmium (B)	7440439	NR	75	NR	NR	NR	NA	NA	NA	Inorganic	112.411
Camphene (I)	79925	NR	NR	2.05E+00	0.08	8.00E-06	NA	NA	33,400	Solid	136.26
Caprolactam	105602	NR	NR	2.53E-08	0.08	8.00E-06	0.014	282	5.25E+09	Solid	113.2
Carbaryl	63252	NR	NR	6.80E-04	0.08	8.00E-06	NA	NA	1.26E+05	Solid	201.24
Carbazole	86748	NR	NR	1.53E-08	0.039	7.03E-06	NA	NA	7,480	Solid	167.21
Carbofuran	1563662	NR	NR	3.90E-10	0.08	8.00E-06	NA	NA	7.00E+05	Solid	221.3
Carbon disulfide (I,R)	75150	NR	NR	3.03E-02	0.104	1.00E-05	0.013	-22	1.19E+06	Liquid	76.14
Carbon tetrachloride	56235	NR	NR	3.04E-02	0.078	8.80E-06	NA	NA	7.93E+05	Liquid	153.92
Chlordane (J)	57749	NR	NR	4.86E-05	0.0118	4.37E-06	NA	NA	56	Solid	409.8
Chloride	16887006	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	35.453
Chlorobenzene (I)	108907	NR	NR	3.70E-03	0.073	8.70E-06	0.013	82	4.72E+05	Liquid	112.56
p-Chlorobenzene sulfonic acid	98668	NR	NR	NA	NA	NA	NA	226	NA	Solid	192.62
1-Chloro-1,1-difluoroethane	75683	NR	NR	6.16E-02	0.08	8.00E-06	0.06	NA	3.90E+06	Gas	100.5
Chloroethane	75003	NR	NR	8.80E-03	0.08	8.00E-06	0.038	-58	5.74E+06	Liquid	64.52
2-Chloroethyl vinyl ether	110758	NR	NR	6.25E-04	0.08	8.00E-06	NA	NA	1.50E+07	Liquid	106.55
Chloroform	67663	NR	NR	3.67E-03	0.104	1.00E-05	NA	NA	7.92E+06	Liquid	119.38
Chloromethane (I)	74873	NR	NR	4.52E-02	0.13	6.50E-06	0.081	-60.8	6.34E+06	Liquid	50.49

4-Chloro-3-methylphenol	59507	NR	NR	4.00E-07	0.08	8.00E-06	NA	NA	3.90E+06	Solid	142.6
beta-Chloronaphthalene	91587	NR	NR	3.10E-04	0.08	8.00E-06	NA	NA	6,740	Solid	162.62
2-Chlorophenol	95578	388	NR	3.91E-04	0.0501	9.46E-06	NA	NA	2.20E+07	Liquid	128.56
o-Chlorotoluene (I)	95498	NR	NR	3.57E-03	0.08	8.00E-06	NA	96	3.73E+05	Liquid	126.58
Chlorpyrifos	2921882	NR	NR	7.80E+00	0.08	8.00E-06	NA	NA	1,120	Solid	350.59
Chromium (III) (B,H)	16065831	NR	1.80E+06	NR	NR	NR	NA	NA	NA	Inorganic	51.996
Chromium (VI)	18540299	NR	19	NR	NR	NR	NA	NA	NA	Inorganic	51.996
Chrysene (Q)	218019	NR	NR	9.46E-05	0.0248	6.21E-06	NA	NA	1.6	Solid	228.3
Cobalt	7440484	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	58.933
Copper (B)	7440508	NR	360	NR	NR	NR	NA	NA	NA	Inorganic	63.546
Cyanazine	21725462	NR	NR	1.00E-10	0.08	8.00E-06	NA	NA	1.70E+05	Solid	241

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PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS

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Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose	Oral Slope Factor	Chronic Inhalation Reference Concentration	Inhalation Unit Risk Factor	Occupational Short Term Exposure Level	Relative Source Contribution for Drinking Water	Ingestion Absorption Efficiency	Dermal Absorption Efficiency	Relative Source Contribution for Soil	Log Octanol-Water Partition Coefficient	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds
		RfD	SF	RfC	IURF	STEL	RSC	AEi	AEd	RSC	Log Kow	Koc
		mg/kg-day	(mg/kg-day) ⁻¹	ug/m ³	(ug/m ³) ⁻¹	ug/m ³	unitless	unitless	unitless	unitless	unitless	L/kg
Cyanide (P,R)	57125	5.40E-03	NA	5.00E+01	NA	NA	0.2	1	0	1	NA	NA
Cyclohexanone	108941	4.50E+00	NA	1.00E+03	NA	NA	0.2	1	0.1	1	0.81	6.26
Dacthal	1861321	1.00E-02	NA	NA	NA	NA	0.2	1	0.1	1	4.4	21,200
Dalapon	75990	8.50E-02	NA	NA	NA	NA	0.2	1	0.1	1	0.77	5.72
4-4'-DDD	72548	3.00E-03	9.40E-02	NA	7.00E-05	NA	0.2	0.5	0.1	1	6.1	81,100
4-4'-DDE	72559	7.00E-04	2.00E-01	NA	9.70E-05	NA	0.2	0.5	0.1	1	6.76	2.70E+05
4-4'-DDT	50293	5.00E-04	2.00E-01	NA	9.70E-05	NA	0.2	0.5	0.03	1	6.53	1.78E+05
Decabromodiphenyl ether	1163195	1.00E-02	NA	3.50E+01	4.00E-07	NA	0.2	0.5	0.1	1	5.24	1.42E+05
Di-n-butyl phthalate	84742	1.20E-01	NA	5.00E+01	NA	NA	0.2	1	0.1	1	4.61	34,000
Di(2-ethylhexyl) adipate	103231	1.70E+00	5.90E-04	NA	3.40E-07	NA	0.2	0.5	0.1	1	6.11	1.01E+06
Di-n-octyl phthalate	117840	1.80E-02	NA	4.70E+02	NA	NA	0.2	0.5	0.1	1	7.51	2.41E+07
Diacetone alcohol (I)	123422	NA	NA	2.40E+03	NA	NA	0.2	1	0.1	1	-0.34	0.464
Diazinon	333415	1.80E-04	NA	NA	NA	NA	0.2	1	0.1	1	3.4	2,200
Dibenzo(a,h)anthracene (Q)	53703	NA	4.10E+00	NA	NA	NA	0.2	0.5	0.13	1	6.69	3.77E+06

Dibenzofuran	132649	NA	NA	1.00E-01	NA	NA	0.2	1	0.1	1	4.2	13,500
Dibromochloromethane	124481	2.10E-02	4.90E-02	NA	2.45E-05	NA	0.2	1	0.1	1	2.17	62.6
Dibromochloropropane	96128	NA	1.20E+00	2.00E-01	5.60E-03	NA	0.2	1	0.1	1	2.68	431
Dibromomethane	74953	1.10E-02	NA	NA	NA	NA	0.2	1	0.1	1	1.62	39.2
Dicamba	1918009	3.00E-02	NA	NA	NA	NA	0.2	0.5	0.1	1	2.4	95.3
1,2-Dichlorobenzene	95501	8.60E-02	NA	1.50E+03	NA	3.01E+05	0.2	1	0.1	1	3.43	623
1,3-Dichlorobenzene	541731	9.00E-04	NA	3.00E+00	NA	NA	0.2	1	0.1	1	3.5	708
1,4-Dichlorobenzene	106467	NA	1.30E-02	8.00E+02	6.90E-06	NA	0.2	1	0.1	1	3.42	612
3,3'-Dichlorobenzidine	91941	NA	8.00E-01	NA	4.80E-04	NA	0.2	1	0.1	1	3.51	721
Dichlorodifluoromethane	75718	2.30E-01	NA	4.95E+04	NA	NA	0.2	1	0.1	1	2.15	60.4
1,1-Dichloroethane	75343	1.20E-01	NA	5.00E+02	NA	NA	0.2	1	0.1	1	1.79	31.3
1,2-Dichloroethane (I)	107062	NA	5.80E-02	NA	2.60E-05	NA	0.2	1	0.1	1	1.47	17.5
1,1-Dichloroethylene (I)	75354	9.00E-04	NA	2.00E+02	5.00E-05	7.90E+04	0.2	1	0.1	1	2.13	58.2
cis-1,2-Dichloroethylene	156592	1.10E-02	NA	3.40E+01	NA	NA	0.2	1	0.1	1	1.86	35.6

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Hazardous Substance	Chemical Abstract Service Number	Soil Koc for Ionizing Organic Compounds at pH=6.8	Soil-Water Distribution Coefficients for Inorganic Compounds at pH=6.8	Henry's Law Constant at 25°C	Air Diffusivity	Water Diffusivity	Lower Explosive Limit in Air	Flash Point	Water Solubility	Physical State at Standard Temperature and Pressure	Molecular Weight
			Kd	HLC	D _i or D _a or D ^{air}	D _w	LEL	FP	S		MW
		L/kg	L/kg	atm-m ³ /mol	cm ² /s	cm ² /s	unitless	°F	ug/L	unitless	g/mol
Cyanide (P,R)	57125	NR	NR	NR	0.08	8.00E-06	NA	NA	NA	Inorganic	26.02
Cyclohexanone	108941	NR	NR	7.80E+00	0.08	8.00E-06	NA	146	2.30E+07	Liquid	98.14
Dacthal	1861321	NR	NR	2.18E-06	0.08	8.00E-06	NA	NA	500	Solid	331
Dalapon	75990	NR	NR	6.43E-08	0.08	8.00E-06	NA	NA	5.02E+08	Liquid	142.97
4-4'-DDD	72548	NR	NR	4.00E-06	0.0169	4.76E-06	NA	NA	90	Solid	320.05
4-4'-DDE	72559	NR	NR	2.10E-05	0.0144	5.87E-06	NA	NA	120	Solid	518.03
4-4'-DDT	50293	NR	NR	8.10E-06	0.0137	4.95E-06	NA	162	25	Solid	354.49
Decabromodiphenyl ether	1163195	NR	NR	4.02E-05	0.08	8.00E-06	NA	NA	30	Solid	959.22
Di-n-butyl phthalate	84742	NR	NR	9.38E-10	0.0438	7.86E-06	NA	315	11,200	Liquid	278.34
Di(2-ethylhexyl) adipate	103231	NR	NR	4.34E-07	0.08	8.00E-06	NA	NA	471	Liquid	370
Di-n-octyl phthalate	117840	NR	NR	7.66E-07	0.0151	3.58E-06	NA	NA	3,000	Liquid	390.62
Diacetone alcohol (I)	123422	NR	NR	2.61E-07	0.08	8.00E-06	0.018	125	1.00E+09	Liquid	116.2

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Diazinon	333415	NR	NR	1.13E-07	0.08	8.00E-06	NA	180	68,800	Liquid	304.3
Dibenzo(a,h)anthracene (Q)	53703	NR	NR	1.47E-08	0.0202	5.18E-06	NA	NA	2.49	Solid	278.36
Dibenzofuran	132649	NR	NR	1.30E-05	0.08	8.00E-06	NA	NA	10,000	Solid	168.21
Dibromochloromethane	124481	NR	NR	7.83E-04	0.0229	1.05E-05	NA	NA	2.60E+06	Liquid	208.29
Dibromochloropropane	96128	NR	NR	1.90E-04	0.08	8.00E-06	NA	170	1,230	Liquid	236.34
Dibromomethane	74953	NR	NR	9.00E-04	0.08	8.60E-06	NA	NA	1.10E+07	Liquid	173.85
Dicamba	1918009	NR	NR	7.90E-09	0.08	8.00E-06	NA	NA	4.50E+06	Solid	221.04
1,2-Dichlorobenzene	95501	NR	NR	1.90E-03	0.069	7.90E-06	0.022	151	1.56E+05	Liquid	147.01
1,3-Dichlorobenzene	541731	NR	NR	1.80E-03	0.08	8.00E-06	NA	NA	1.11E+05	Liquid	147.01
1,4-Dichlorobenzene	106467	NR	NR	2.43E-03	0.069	7.90E-06	0.025	150	73,800	Solid	147
3,3'-Dichlorobenzidine	91941	NR	NR	4.00E-09	0.0194	6.74E-06	NA	NA	3,110	Solid	253.1
Dichlorodifluoromethane	75718	NR	NR	2.60E+00	0.08	8.00E-06	NA	NA	3.00E+05	Liquid	120.91
1,1-Dichloroethane	75343	NR	NR	5.62E-03	0.0742	1.05E-05	0.054	2	5.06E+06	Liquid	98.96
1,2-Dichloroethane (I)	107062	NR	NR	9.79E-04	0.104	9.90E-06	0.062	56	8.52E+06	Liquid	98.97
1,1-Dichloroethylene (I)	75354	NR	NR	2.61E-02	0.09	1.04E-05	0.065	-2	2.25E+06	Liquid	96.94
cis-1,2-Dichloroethylene	156592	NR	NR	4.08E-03	0.0736	1.13E-05	0.056	36	3.50E+06	Liquid	96.94

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Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose	Oral Slope Factor	Chronic Inhalation Reference Concentration	Inhalation Unit Risk Factor	Occupational Short Term Exposure Level	Relative Source Contribution for Drinking Water	Ingestion Absorption Efficiency	Dermal Absorption Efficiency	Relative Source Contribution for Soil	Log Octanol-Water Partition Coefficient	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds
		RfD	SF	RfC	IURF	STEL	RSC	AEi	AEd	RSC	Log Kow	Koc
		mg/kg-day	(mg/kg-day) ⁻¹	ug/m ³	(ug/m ³) ⁻¹	ug/m ³	unitless	unitless	unitless	unitless	unitless	L/kg
trans-1,2-Dichloroethylene	156605	1.70E-02	NA	7.00E+01	NA	NA	0.2	1	0.1	1	2.07	52.2
2,6-Dichloro-4-nitroaniline	99309	3.00E-01	NA	NA	NA	NA	0.2	1	0.1	1	2.76	517
2,4-Dichlorophenol	120832	1.00E-02	NA	7.70E+01	NA	NA	0.2	1	0.1	1	3.08	147
2,4-Dichlorophenoxyacetic acid	94757	1.00E-02	NA	1.00E+02	NA	NA	0.2	1	0.05	1	2.7	451
1,2-Dichloropropane (I)	78875	4.40E-01	3.70E-02	4.00E+00	NA	5.08E+05	0.2	1	0.1	1	1.97	43.5
1,3-Dichloropropene	542756	3.40E-02	1.00E-01	2.00E+01	4.00E-06	NA	0.2	1	0.1	1	2	45.9
Dichlorovos	62737	4.00E-04	5.20E-01	5.00E-01	NA	NA	0.2	1	0.1	1	1.4	15.4
Dicyclohexyl phthalate	84617	NA	NA	NA	NA	NA	0.2	0.5	0.1	1	6.2	1.24E+06
Dieldrin	60571	7.60E-05	8.00E+00	NA	4.60E-03	NA	0.2	0.5	0.1	1	5.37	21,400

Diethyl ether	60297	5.00E-01	NA	1.20E+04	NA	1.52E+06	0.2	1	0.1	1	0.83	6.55
Diethyl phthalate	84662	7.50E-01	NA	5.00E+01	NA	NA	0.2	1	0.1	1	2.5	287
Diethylene glycol monobutyl ether	112345	1.20E-02	NA	2.00E+01	NA	NA	0.2	1	0.1	1	0.32	2.06
Diisopropyl ether	108203	4.10E-03	NA	3.58E+02	NA	NA	0.2	1	0.1	1	1.67	25.2
Diisopropylamine (I)	108189	7.70E-04	NA	2.00E+02	NA	NA	0.2	1	0.1	1	1.6	37.4
Dimethyl phthalate	131113	1.00E+01	NA	5.00E+01	NA	NA	0.2	1	0.1	1	1.64	41
N,N-Dimethylacetamide	127195	2.50E-02	NA	NA	NA	NA	0.2	1	0.1	1	-0.77	0.175
N,N-Dimethylaniline	121697	2.20E-03	NA	NA	1.18E-05	5.00E+04	0.2	1	0.1	1	2.46	262
Dimethylformamide (I)	68122	9.60E-02	NA	3.00E+01	NA	NA	0.2	1	0.1	1	-1.01	0.102
2,4-Dimethylphenol	105679	5.00E-02	NA	7.00E+01	NA	NA	0.2	1	0.1	1	2.36	209
2,6-Dimethylphenol	576261	6.00E-04	NA	2.00E+00	NA	NA	0.2	1	0.1	1	2.36	209
3,4-Dimethylphenol	95658	1.40E-03	NA	3.50E+00	NA	NA	0.2	1	0.1	1	2.23	156
Dimethylsulfoxide	67685	3.00E+01	NA	2.00E+01	NA	NA	0.2	1	0.1	1	-1.66	0.0234
2,4-Dinitrotoluene	121142	2.00E-03	1.10E-01	2.00E+00	2.00E-04	NA	0.2	1	0.1	1	2.01	94.6
Dinoseb	88857	1.00E-03	NA	4.00E+00	NA	NA	0.2	1	0.1	1	3.15	1,250
1,4-Dioxane (I)	123911	NA	1.00E-02	100	5.50E-06	NA	0.2	1	0.1	1	-0.39	0.588
Diquat	85007	2.20E-03	NA	NA	NA	NA	0.2	1	0.1	1	-2.82	0.00169
Dissolved oxygen (DO)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diuron	330541	4.30E-03	NA	7.00E+00	NA	NA	0.2	1	0.1	1	2.77	187

TABLE 4. TOXICOLOGICAL AND CHEMICAL-PHYSICAL DATA
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS

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Hazardous Substance	Chemical Abstract Service Number	Soil Koc for Ionizing Organic Compounds at pH=6.8	Soil-Water Distribution Coefficients for Inorganic Compounds at pH=6.8	Henry's Law Constant at 25°C	Air Diffusivity	Water Diffusivity	Lower Explosive Limit in Air	Flash Point	Water Solubility	Physical State at Standard Temperature and Pressure	Molecular Weight
			Kd	HLC	D _i or D _a or D ^{air}	D _w	LEL	FP	S		MW
		L/kg	L/kg	atm-m ³ /mol	cm ² /s	cm ² /s	unitless	°F	ug/L	unitless	g/mol
trans-1,2-Dichloroethylene	156605	NR	NR	9.38E-03	0.0707	1.19E-05	0.056	36	6.30E+06	Liquid	96.94
2,6-Dichloro-4-nitroaniline	99309	NR	NR	4.67E-08	0.08	8.00E-06	NA	NA	7,000	Solid	207.02
2,4-Dichlorophenol	120832	147	NR	3.16E-06	0.0346	8.77E-06	NA	NA	4.50E+06	Liquid	163
2,4-Dichlorophenoxyacetic acid	94757	NR	NR	4.50E-06	0.059	6.50E-06	NA	NA	6.80E+05	Solid	221.04
1,2-Dichloropropane (I)	78875	NR	NR	2.80E-03	0.0782	8.73E-06	0.034	60	2.80E+06	Liquid	112.99
1,3-Dichloropropene	542756	NR	NR	1.77E-02	0.0626	1.00E-05	0.053	77	2.80E+06	Liquid	110.97

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Dichlorovos	62737	NR	NR	9.58E-07	0.08	8.00E-06	NA	175	1.60E+07	Liquid	220.98
Dicyclohexyl phthalate	84617	NR	NR	7.61E-05	0.08	8.00E-06	NA	NA	4,000	Solid	330.43
Dieldrin	60571	NR	NR	1.51E-05	0.0125	4.74E-06	NA	NA	195	Solid	380.9
Diethyl ether	60297	NR	NR	8.70E-04	0.074	9.30E-06	0.019	-49	6.10E+07	Liquid	74.12
Diethyl phthalate	84662	NR	NR	4.50E-07	0.0256	6.35E-06	NA	322	1.08E+06	Liquid	222.23
Diethylene glycol monobutyl ether	112345	NR	NR	1.52E-09	0.08	8.00E-06	NA	NA	1.00E+09	Liquid	162.23
Diisopropyl ether	108203	NR	NR	1.30E-03	0.08	8.00E-06	0.014	-18	8,041	Liquid	102.18
Diisopropylamine (I)	108189	NR	NR	9.60E-05	0.08	8.00E-06	0.011	20	3.69E+07	Liquid	101.22
Dimethyl phthalate	131113	NR	NR	5.78E-07	0.067	6.30E-06	NA	295	4.19E+06	Liquid	194.19
N,N-Dimethylacetamide	127195	NR	NR	1.31E-08	0.08	8.00E-06	NA	158	1.00E+09	Liquid	87.14
N,N-Dimethylaniline	121697	NR	NR	8.12E-05	0.08	8.00E-06	NA	142	1.27E+06	Liquid	121.18
Dimethylformamide (I)	68122	NR	NR	7.39E-08	0.08	8.00E-06	NA	136	1.00E+09	Liquid	73.1
2,4-Dimethylphenol	105679	NR	NR	2.00E-06	0.0584	8.69E-06	NA	NA	7.87E+06	Solid	122.16
2,6-Dimethylphenol	576261	NR	NR	5.02E-06	0.08	8.00E-06	NA	NA	6.14E+06	Solid	122.16
3,4-Dimethylphenol	95658	NR	NR	3.78E-07	0.08	8.00E-06	NA	NA	4.93E+06	Solid	122.16
Dimethylsulfoxide	67685	NR	NR	5.80E-08	0.08	8.00E-06	NA	NA	1.66E+08	Liquid	78.14
2,4-Dinitrotoluene	121142	NR	NR	9.26E-08	0.203	7.06E-06	NA	NA	2.70E+05	Solid	183.15
Dinoseb	88857	NR	NR	4.60E-07	0.08	8.00E-06	NA	NA	52,000	Liquid	240.2
1,4-Dioxane (I)	123911	NR	NR	4.90E-06	0.23	1.00E-05	0.02	55	9.00E+08	Liquid	88.11
Diquat	85007	NR	NR	1.42E-13	0.08	8.00E-06	NA	NA	7.00E+05	Solid	344.08
Dissolved oxygen (DO)	NA	NR	NA	NR	NA	NA	NA	NA	NA	NA	NA
Diuron	330541	NR	NR	2.70E-06	0.08	8.00E-06	NA	NA	37,300	Solid	233.1

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Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose	Oral Slope Factor	Chronic Inhalation Reference Concentration	Inhalation Unit Risk Factor	Occupational Short Term Exposure Level	Relative Source Contribution for Drinking Water	Ingestion Absorption Efficiency	Dermal Absorption Efficiency	Relative Source Contribution for Soil	Log Octanol-Water Partition Coefficient	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds
		RfD	SF	RfC	IURF	STEL	RSC	AEi	AEd	RSC	Log Kow	Koc
		mg/kg-day	(mg/kg-day) ⁻¹	ug/m ³	(ug/m ³) ⁻¹	ug/m ³	unitless	unitless	unitless	unitless	unitless	L/kg
Endosulfan (J)	115297	6.00E-03	NA	NA	NA	NA	0.2	1	0.1	1	4.1	2,110
Endothall	145733	1.70E-02	NA	3.50E+01	NA	NA	0.2	1	0.1	1	-0.55	0.288
Endrin	72208	1.70E-04	NA	NA	NA	NA	0.2	0.5	0.1	1	5.06	12,200

Epichlorohydrin (I)	106898	1.00E-03	5.90E-01	1.00E+00	1.20E-06	NA	0.2	1	0.1	1	0.26	1.92
Ethanol (I)	64175	6.20E+01	NA	1.90E+04	NA	NA	1	1	0.1	1	-0.31	0.496
Ethyl acetate (I)	141786	9.00E-01	NA	3.20E+03	NA	NA	0.2	1	0.1	1	0.69	4.77
Ethyl-tert-butyl ether (ETBE)	637923	NA	NA	3.73E+02	NA	NA	NA	1	0.1	1	1.92	3.97
Ethylbenzene (I)	100414	9.70E-02	NA	1.00E+03	3.10E-07	5.43E+05	0.2	1	0.1	1	3.14	367
Ethylene dibromide	106934	NA	5.70E+01	9.00E+00	2.20E-04	NA	0.2	1	0.1	1	1.75	52.5
Ethylene glycol	107211	2.00E+00	NA	1.00E+03	NA	1.00E+05	0.2	1	0.1	1	-1.4	0.0421
Ethylene glycol monobutyl ether	111762	5.00E-01	NA	1.30E+04	NA	NA	0.2	1	0.1	1	0.83	6.55
Fluoranthene	206440	1.20E-01	NA	1.40E+02	NA	NA	0.2	0.5	0.1	1	5.12	1.08E+05
Fluorene	86737	1.20E-01	NA	1.40E+02	NA	NA	0.2	1	0.1	1	4.21	13,800
Fluorine (soluble fluoride) (B)	7782414	6.00E-02	NA	NA	NA	3.10E+03	1	0.5	0.01	1	NR	NR
Formaldehyde	50000	1.80E-01	NA	9.00E+00	1.30E-05	3.70E+02	0.2	1	0.1	1	-0.051	1.09
Formic acid (I,U)	64186	1.40E+00	NA	2.00E+00	NA	1.90E+04	0.2	1	0.1	1	-0.538	0.449
1-Formylpiperidine	2591868	1.10E-02	NA	NA	NA	NA	0.2	1	0.1	1	NA	NA
Gentian violet	548629	1.40E-01	5.50E-02	NA	NA	NA	0.2	1	0.1	1	0.51	3.17
Glyphosate	1071836	1.00E-01	NA	NA	NA	NA	0.2	0.5	0.1	1	-4.47	4.04E-05
Heptachlor	76448	2.30E-03	1.60E+00	NA	1.30E-03	NA	0.2	0.5	0.1	1	6.26	1.43E+06
Heptachlor epoxide	1024573	8.50E-06	2.90E+00	NA	2.60E-03	NA	0.2	0.5	0.1	1	5	82,300
n-Heptane	142825	4.40E+00	NA	3.50E+03	NA	2.05E+06	0.2	1	0.1	1	4.72	43,700
Hexabromobenzene	87821	2.80E-03	NA	NA	NA	NA	0.2	0.5	0.1	1	6.1	9.92E+05
Hexachlorobenzene (C-66)	118741	8.00E-04	1.00E+00	NA	4.60E-04	NA	0.2	0.5	0.1	1	5.89	55,300
Hexachlorobutadiene (C-46)	87683	2.00E-03	5.20E-02	NA	2.20E-05	NA	0.2	1	0.1	1	4.81	53,500
alpha-Hexachlorocyclohexane	319846	NA	2.00E+00	NA	1.83E-03	NA	0.2	1	0.1	1	3.8	1,220
beta-Hexachlorocyclohexane	319857	NA	9.70E-01	NA	5.30E-04	NA	0.2	1	0.1	1	3.81	1,250
Hexachlorocyclopentadiene (C-56)	77474	6.00E-03	NA	2.00E-01	NA	NA	0.2	0.5	0.1	1	5.39	1.99E+05

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			Kd	HLC	D _i or D _a or D ^{air}	D _w	LEL	FP	S		MW
		L/kg	L/kg	atm-m ³ /mol	cm ² /s	cm ² /s	unitless	°F	ug/L	unitless	g/mol
Endosulfan (J)	115297	NR	NR	1.12E-05	0.0115	4.55E-06	NA	NA	510	Solid	406.9
Endothall	145733	NR	NR	2.60E-10	0.08	8.00E-06	NA	NA	1.00E+08	Solid	186.18

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Endrin	72208	NR	NR	7.52E-06	0.0125	4.74E-06	NA	NA	250	Solid	380.9
Epichlorohydrin (I)	106898	NR	NR	3.00E-05	0.086	9.80E-06	0.038	93	6.60E+07	Liquid	92.53
Ethanol (I)	64175	NR	NR	6.29E-06	0.08	8.00E-06	0.033	55	1.00E+09	Liquid	46.07
Ethyl acetate (I)	141786	NR	NR	1.70E-04	0.073	9.70E-06	0.02	24	6.40E+07	Liquid	88.12
Ethyl-tert-butyl ether (ETBE)	637923	NR	NR	1.39E-03	0.08	8.00E-06	NA	NA	5.63E+06	Liquid	102.18
Ethylbenzene (I)	100414	NR	NR	7.88E-03	0.075	7.80E-06	0.008	55	1.69E+05	Liquid	106.17
Ethylene dibromide	106934	NR	NR	4.60E-04	0.08	8.00E-06	NA	NA	4.20E+06	Liquid	187.9
Ethylene glycol	107211	NR	NR	6.00E-08	0.08	8.00E-06	0.032	232	1.00E+09	Liquid	62.07
Ethylene glycol monobutyl ether	111762	NR	NR	5.13E-02	0.08	8.00E-06	NA	143	2.24E+08	Liquid	118.2
Fluoranthene	206440	NR	NR	1.61E-05	0.0302	6.35E-06	NA	NA	206	Solid	202.24
Fluorene	86737	NR	NR	6.36E-05	0.0363	7.88E-06	NA	NA	1,980	Solid	166.23
Fluorine (soluble fluoride) (B)	7782414	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	38
Formaldehyde	50000	NR	NR	2.80E-04	0.18	2.00E-05	0.07	NA	5.50E+08	Liquid	30.03
Formic acid (I,U)	64186	NR	NR	2.50E-06	0.079	1.40E-06	0.18	122	1.00E+09	Liquid	46.03
1-Formylpiperidine	2591868	NR	NR	NA	0.08	8.00E-06	NA	NA	NA	Liquid	113.2
Gentian violet	548629	NR	NR	3.06E-16	0.08	8.00E-06	NA	NA	1.00E+06	Solid	408
Glyphosate	1071836	NR	NR	1.50E-09	0.08	8.00E-06	NA	NA	1.16E+07	Solid	169.09
Heptachlor	76448	NR	NR	1.48E-03	0.0112	5.69E-06	NA	NA	180	Solid	373.4
Heptachlor epoxide	1024573	NR	NR	9.50E-06	0.0132	4.23E-06	NA	NA	200	Solid	389.32
n-Heptane	142825	NR	NR	2.11E+00	0.08	8.00E-06	0.0105	25	2,690	Liquid	100.2
Hexabromobenzene	87821	NR	NR	1.30E-05	0.08	8.00E-06	NA	NA	0.17	Solid	551
Hexachlorobenzene (C-66)	118741	NR	NR	1.32E-03	0.0542	5.91E-06	NA	NA	6,200	Solid	284.78
Hexachlorobutadiene (C-46)	87683	NR	NR	8.15E-03	0.0561	6.16E-06	NA	NA	3,230	Liquid	260.76
alpha-Hexachlorocyclohexane	319846	NR	NR	1.06E-05	0.0142	7.34E-06	NA	NA	2,000	Solid	290.82
beta-Hexachlorocyclohexane	319857	NR	NR	7.43E-07	0.0142	7.34E-06	NA	NA	240	Solid	290.82
Hexachlorocyclopentadiene (C-56)	77474	NR	NR	2.70E-02	0.0161	7.21E-06	NA	NA	1,800	Liquid	272.77

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Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose	Oral Slope Factor	Chronic Inhalation Reference Concentration	Inhalation Unit Risk Factor	Occupational Short Term Exposure Level	Relative Source Contribution for Drinking Water	Ingestion Absorption Efficiency	Dermal Absorption Efficiency	Relative Source Contribution for Soil	Log Octanol-Water Partition Coefficient	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds
		RfD	SF	RfC	IURF	STEL	RSC	AEi	AEd	RSC	Log Kow	Koc

		mg/kg-day	(mg/kg-day) ⁻¹	ug/m ³	(ug/m ³) ⁻¹	ug/m ³	unitless	unitless	unitless	unitless	unitless	L/kg
Hexachloroethane	67721	1.00E-03	8.50E-03	3.50E+00	4.00E-06	NA	0.2	1	0.1	1	4	1,760
n-Hexane	110543	4.10E-01	NA	2.00E+02	NA	NA	0.2	1	0.1	1	4	1,760
2-Hexanone	591786	1.40E-01	NA	4.00E+01	NA	NA	0.2	1	0.1	1	1.4	23.8
Indeno(1,2,3-cd)pyrene (Q)	193395	NA	4.10E-01	NA	NA	NA	0.2	0.5	0.13	1	6.65	3.45E+06
Iron (B)	7439896	3.00E-01	NA	NA	NA	NA	0.2	0.5	0.01	1	NR	NR
Isobutyl alcohol (I)	78831	3.20E-01	NA	1.50E+03	NA	NA	0.2	1	0.1	1	0.75	5.46
Isophorone	78591	1.50E-01	1.10E-03	2.80E+02	2.70E-07	2.80E+04	0.2	1	0.1	1	1.699	46.8
Isopropyl alcohol (I)	67630	6.40E-02	NA	2.20E+02	NA	1.23E+06	0.2	1	0.1	1	0.05	1.31
Isopropyl benzene	98828	1.10E-01	NA	8.70E+01	NA	NA	0.2	1	0.1	1	3.6	3,460
Lead (B)	7439921	NA	NA	1.50E+00	NA	NA	0.2	0.5	0.01	1	NR	NR
Lindane	58899	3.30E-04	7.10E-01	NA	NA	NA	0.2	1	0.04	1	3.73	1,080
Lithium (B)	7439932	2.80E-02	NA	3.50E+01	NA	NA	0.2	0.5	0.01	1	NR	NR
Magnesium (B)	7439954	1.10E+01	NA	1.00E+02	NA	NA	1	0.5	0.01	1	NR	NR
Manganese (B)	7439965	4.70E-02	NA	5.00E-02	NA	NA	0.5	0.5	0.01	1	NR	NR
Mercury (Total) (B,Z)	Varies	3.00E-04	NA	3.00E-01	NA	NA	0.2	0.5	0.01	1	5.95	NR
Methane	74828	NA	NA	NA	NA	NA	0.2	1	0.1	1	1.09	11.8
Methanol	67561	5.00E-01	NA	3.25E+03	NA	3.28E+06	0.2	1	0.1	1	-0.72	0.196
Methoxychlor	72435	5.00E-03	NA	NA	NA	NA	0.2	0.5	0.1	1	5.08	12,600
2-Methoxyethanol (I)	109864	1.00E-03	NA	2.00E+01	NA	NA	0.2	1	0.1	1	-0.77	0.175
2-Methyl-4-chlorophenoxyacetic acid	94746	1.00E-03	NA	NA	NA	NA	0.2	1	0.1	1	3.25	1,570
2-Methyl-4,6-dinitrophenol	534521	3.50E-04	NA	2.00E+00	NA	NA	0.2	1	0.1	1	2.1	116
N-Methyl-morpholine (I)	109024	2.70E-03	NA	NA	NA	NA	0.2	1	0.1	1	-0.33	0.474
Methyl parathion	298000	2.50E-04	NA	NA	NA	NA	0.2	1	0.1	1	2.9	710
4-Methyl-2-pentanone (MIBK) (I)	108101	2.50E-01	NA	2.05E+03	NA	3.07E+06	0.2	1	0.1	1	1.18	14.5
Methyl-tert-butyl ether (MTBE)	1634044	3.30E-02	3.40E-03	3.00E+03	NA	NA	0.2	1	0.1	1	0.99	9.41
Methylcyclopentane (I)	96377	NA	NA	700	NA	NA	0.2	1	0.1	1	3.37	2,060
4,4'-Methylene-bis-2- chloroaniline	101144	7.30E-04	7.70E-01	NA	3.70E-05	NA	0.2	1	0.1	1	3.92	7,140
Methylene chloride	75092	5.80E-02	4.20E-03	2.00E+03	4.70E-07	NA	0.2	1	0.1	1	1.26	11.9

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PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS

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Hazardous Substance	Chemical Abstract Service Number	Soil Koc for Ionizing Organic Compounds	Soil-Water Distribution Coefficients for Inorganic Compounds at	Henry's Law Constant at 25°C	Air Diffusivity	Water Diffusivity	Lower Explosive Limit in Air	Flash Point	Water Solubility	Physical State at Standard Temperature and Pressure	Molecular Weight
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		at pH=6.8	pH=6.8								
			Kd	HLC	D ₁ or D ₃ or D ^{air}	D _w	LEL	FP	S		MW
		L/kg	L/kg	atm-m ³ /mol	cm ² /s	cm ² /s	unitless	°F	ug/L	unitless	g/mol
Hexachloroethane	67721	NR	NR	3.89E-03	0.0025	6.80E-06	NA	NA	50,000	Solid	236.74
n-Hexane	110543	NR	NR	1.40E-02	0.08	8.00E-06	0.011	-7	12,000	Liquid	86.18
2-Hexanone	591786	NR	NR	9.57E-05	0.08	8.00E-06	NA	77	1.60E+07	Liquid	100.16
Indeno(1,2,3-cd)pyrene (Q)	193395	NR	NR	1.60E-06	0.019	5.66E-06	NA	NA	0.022	Solid	276.34
Iron (B)	7439896	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	55.845
Isobutyl alcohol (I)	78831	NR	NR	1.30E-05	0.08	8.00E-06	NA	82	7.60E+07	Liquid	74.14
Isophorone	78591	NR	NR	6.20E-06	0.0623	6.76E-06	0.008	184	1.20E+07	Liquid	138.23
Isopropyl alcohol (I)	67630	NR	NR	8.07E-06	0.08	8.00E-06	0.02	53	1.00E+09	Liquid	60.09
Isopropyl benzene	98828	NR	NR	1.50E-02	0.086	7.10E-06	0.009	96	56,000	Liquid	122.16
Lead (B)	7439921	NR	11,000	NR	NR	NR	NA	NA	NA	Inorganic	207.2
Lindane	58899	NR	NR	1.40E-05	0.0176	7.34E-06	NA	NA	6,800	Solid	290.9
Lithium (B)	7439932	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	6.941
Magnesium (B)	7439954	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	24.305
Manganese (B)	7439965	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	54.938
Mercury (Total) (B,Z)	Varies	NR	52	7.10E-10	0.037	6.30E-06	NA	NA	56	Inorganic	200.59
Methane	74828	NR	NR	6.58E-01	0.08	8.00E-06	0.053	-306	NA	Gas	16.04
Methanol	67561	NR	NR	1.70E-04	0.15	1.30E-05	0.06	52	2.90E+07	Liquid	32.05
Methoxychlor	72435	NR	NR	1.58E-05	0.0156	4.46E-06	NA	NA	45	Solid	345.7
2-Methoxyethanol (I)	109864	NR	NR	9.51E-07	0.08	8.00E-06	NA	NA	1.00E+09	Liquid	76.1
2-Methyl-4-chlorophenoxyacetic acid	94746	NR	NR	1.33E-09	0.08	8.00E-06	NA	NA	9.24E+05	Solid	305.79
2-Methyl-4,6-dinitrophenol	534521	NR	NR	4.30E-07	0.08	8.00E-06	NA	NA	2.00E+05	Solid	198.13
N-Methyl-morpholine (I)	109024	NR	NR	2.50E-07	0.08	8.00E-06	NA	NA	1.00E+09	Liquid	101.17
Methyl parathion	298000	NR	NR	1.10E-07	0.08	8.00E-06	NA	NA	50,000	Solid	263.23
4-Methyl-2-pentanone (MIBK) (I)	108101	NR	NR	1.20E-04	0.075	7.80E-06	NA	64	2.00E+07	Liquid	100.2
Methyl-tert-butyl ether (MTBE)	1634044	NR	NR	6.39E-04	0.08	8.00E-06	NA	NA	4.68E+07	Liquid	88.15
Methylcyclopentane (I)	96377	NR	NR	3.63E-01	0.08	8.00E-06	NA	NA	73,890	Liquid	84.16
4,4'-Methylene-bis-2-chloroaniline	101144	NR	NR	4.10E-11	0.08	8.00E-06	NA	NA	14,000	Solid	267.17
Methylene chloride	75092	NR	NR	2.40E-03	0.101	1.17E-05	0.13	NA	1.70E+07	Liquid	50.5

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Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose	Oral Slope Factor	Chronic Inhalation Reference Concentration	Inhalation Unit Risk Factor	Occupational Short Term Exposure Level	Relative Source Contribution for Drinking Water	Ingestion Absorption Efficiency	Dermal Absorption Efficiency	Relative Source Contribution for Soil	Log Octanol-Water Partition Coefficient	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds
		RfD	SF	RfC	IURF	STEL	RSC	AEi	AEd	RSC	Log Kow	Koc
		mg/kg-day	(mg/kg-day) ⁻¹	ug/m ³	(ug/m ³) ⁻¹	ug/m ³	unitless	unitless	unitless	unitless	unitless	L/kg
2-Methylnaphthalene	91576	3.60E-02	NA	1.00E+01	NA	NA	0.2	1	0.1	1	3.9	6,820
Methylphenols (J)	1319773	5.00E-02	NA	1.00E+02	NA	NA	0.2	1	0.1	1	1.99	45.1
Metolachlor	51218452	2.30E-01	3.50E-03	NA	NA	NA	0.2	1	0.1	1	3.13	361
Metribuzin	21087649	2.50E-02	NA	NA	NA	NA	0.2	0.5	0.1	1	1.7	46.9
Mirex	2385855	2.30E-04	9.30E-01	NA	NA	NA	0.2	0.5	0.1	1	6.7	3.86E+06
Molybdenum (B)	7439987	5.00E-03	NA	NA	NA	NA	0.4	0.5	0.01	1	NR	NR
Naphthalene	91203	7.10E-02	NA	3.00E+00	3.10E-06	7.90E+04	0.2	1	0.1	1	3.36	2,010
Nickel (B)	7440020	7.60E-02	NA	NA	2.40E-04	NA	0.2	0.5	0.01	1	NR	NR
Nitrate (B,N)	14797558	1.60E+00	NA	NA	NA	NA	1	0.5	0.01	1	NR	NR
Nitrite (B,N)	14797650	1.00E-01	NA	NA	NA	NA	1	0.5	0.01	1	NR	NR
Nitrobenzene (I)	98953	4.60E-04	NA	7.00E-01	2.00E-05	NA	0.2	1	0.1	1	1.84	64.4
2-Nitrophenol	88755	2.80E-03	NA	NA	NA	NA	0.2	1	0.1	1	1.8	58.8
n-Nitroso-di-n-propylamine	621647	2.50E-01	4.50E+00	NA	2.00E-03	NA	0.2	1	0.1	1	1.4	23.8
N-Nitrosodiphenylamine	86306	2.50E-01	3.10E-03	NA	1.40E-06	NA	0.2	1	0.1	1	3.16	381
Oxamyl	23135220	3.80E-02	NA	NA	NA	NA	0.2	1	0.1	1	-0.47	0.508
Oxo-hexyl acetate	88230357	1.00E-02	NA	3.10E+01	NA	NA	0.2	1	0.1	1	NA	NA
Pendimethalin	40487421	1.20E-01	NA	NA	NA	NA	0.2	0.5	0.1	1	5.18	1.24E+05
Pentachlorobenzene	608935	8.30E-04	NA	NA	NA	NA	0.2	0.5	0.1	1	5.26	1.48E+05
Pentachloronitrobenzene	82688	7.50E-03	NA	5.00E+00	NA	NA	0.2	1	0.1	1	4.64	36,400
Pentachlorophenol	87865	3.00E-02	6.80E-02	1.00E+02	3.00E-05	NA	0.2	0.5	0.25	1	5.09	592
Pentane	109660	NA	NA	1.80E+04	NA	2.21E+06	0.2	1	0.1	1	3.42	2,300
2-Pentene (I)	109682	NA	NA	NA	NA	NA	0.2	1	0.1	1	2.58	344
pH	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NR
Phenanthrene	85018	7.10E-03	NA	1.00E-01	NA	NA	0.2	1	0.1	1	4.6	33,300
Phenol	108952	6.00E-01	NA	6.00E+02	NA	NA	0.2	1	0.1	1	1.48	17.8
Phenytoin	57410	3.00E-02	5.10E-02	NA	1.40E-05	NA	0.2	1	0.1	1	2.47	1473
Phosphorus (Total)	7723140	1.10E+01	NA	1.00E+00	NA	NA	0.2	0.5	0.1	1	NR	NA
Phthalic acid	88993	1.90E+00	NA	NA	NA	NA	0.2	1	0.1	1	0.73	5.22

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Hazardous Substance	Chemical Abstract Service Number	Soil Koc for Ionizing Organic Compounds at pH=6.8	Soil-Water Distribution Coefficients for Inorganic Compounds at pH=6.8	Henry's Law Constant at 25°C	Air Diffusivity	Water Diffusivity	Lower Explosive Limit in Air	Flash Point	Water Solubility	Physical State at Standard Temperature and Pressure	Molecular Weight
			Kd	HLC	D _i or D _a or D ^{air}	D _w	LEL	FP	S		MW
		L/kg	L/kg	atm-m ³ /mol	cm ² /s	cm ² /s	unitless	°F	ug/L	unitless	g/mol
2-Methylnaphthalene	91576	NR	NR	4.99E-04	0.08	8.00E-06	NA	NA	24,600	Solid	142.2
Methylphenols (J)	1319773	NR	NR	1.60E-06	0.074	8.30E-06	NA	178	2.80E+07	Solid	108.13
Metolachlor	51218452	NR	NR	9.90E-09	0.08	8.00E-06	NA	NA	5.30E+05	Liquid	283.83
Metribuzin	21087649	NR	NR	8.80E-02	0.08	8.00E-06	NA	NA	1.20E+06	Solid	214.29
Mirex	2385855	NR	NR	5.16E-04	0.08	8.00E-06	NA	NA	6.80E-06	Solid	545.54
Molybdenum (B)	7439987	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	95.94
Naphthalene	91203	NR	NR	4.83E-04	0.059	7.50E-06	0.009	174	31,000	Solid	128.17
Nickel (B)	7440020	NR	65	NR	NR	NR	NA	NA	NA	Inorganic	58.7
Nitrate (B,N)	14797558	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	62
Nitrite (B,N)	14797650	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	46
Nitrobenzene (I)	98953	NR	NR	2.40E-05	0.076	8.60E-06	NA	190	2.09E+06	Liquid	123.11
2-Nitrophenol	88755	NR	NR	3.50E-06	0.08	8.00E-06	NA	NA	2.50E+06	Solid	139.11
n-Nitroso-di-n-propylamine	621647	NR	NR	2.25E-06	0.0545	8.17E-06	NA	NA	9.89E+06	Liquid	130.22
N-Nitrosodiphenylamine	86306	NR	NR	5.00E-06	0.0312	6.35E-06	NA	NA	35,100	Solid	198.22
Oxamyl	23135220	NR	NR	2.37E-10	0.08	8.00E-06	NA	NA	2.80E+08	Solid	219.29
Oxo-hexyl acetate	88230357	NR	NR	NA	0.08	8.00E-06	NA	NA	NA	Liquid	144.2
Pendimethalin	40487421	NR	NR	8.56E-07	0.08	8.00E-06	NA	NA	275	Solid	281.31
Pentachlorobenzene	608935	NR	NR	8.40E-04	0.067	6.30E-06	NA	NA	650	Liquid	250.3
Pentachloronitrobenzene	82688	NR	NR	2.90E-02	0.08	8.00E-06	NA	NA	32	Solid	295.32
Pentachlorophenol	87865	592	NR	2.44E-08	0.056	6.10E-06	NA	NA	1.85E+06	Solid	266.32
Pentane	109660	NR	NR	1.26E+00	0.08	8.00E-06	0.015	-57	38,200	Liquid	72.15
2-Pentene (I)	109682	NR	NR	2.30E-01	0.08	8.00E-06	NA	NA	2.03E+05	Liquid	70.13
pH	NA	NR	NA	NR	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	85018	NR	NR	2.30E-05	0.08	8.00E-06	NA	NA	1,000	Solid	178.24
Phenol	108952	NR	NR	3.97E-07	0.082	9.10E-06	0.018	175	8.28E+07	Liquid	147.01

Phenytoin	57410	NA	NR	1.02E-11	0.08	8.00E-06	NA	NA	3.20E+04	Solid	252.2718
Phosphorus (Total)	7723140	NR	NR	NR	0.08	8.00E-06	NA	NA	NA	Solid	30.974
Phthalic acid	88993	NR	NR	2.18E-12	0.08	8.00E-06	NA	NA	1.42E+07	Liquid	166.13

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Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose	Oral Slope Factor	Chronic Inhalation Reference Concentration	Inhalation Unit Risk Factor	Occupational Short Term Exposure Level	Relative Source Contribution for Drinking Water	Ingestion Absorption Efficiency	Dermal Absorption Efficiency	Relative Source Contribution for Soil	Log Octanol-Water Partition Coefficient	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds
		RfD	SF	RfC	IURF	STEL	RSC	AEi	AEd	RSC	Log Kow	Koc
		mg/kg-day	(mg/kg-day) ⁻¹	ug/m ³	(ug/m ³) ⁻¹	ug/m ³	unitless	unitless	unitless	unitless	unitless	L/kg
Phthalic anhydride	85449	2.10E+00	NA	NA	NA	NA	0.2	1	0.1	1	1.6	37.4
Picloram	1918021	7.00E-02	NA	NA	NA	NA	0.2	1	0.1	1	0.3	1.97
Piperidine	110894	4.40E-04	NA	1.40E+02	NA	NA	0.2	1	0.1	1	0.84	6.7
Polybrominated biphenyls (J)	67774327	4.30E-06	7.20E+00	NA	NA	NA	0.2	0.5	0.1	1	7.07	8.91E+06
Polychlorinated biphenyls (PCBs) (J,T)	1336363	2.00E-05	2.00E+00	NA	6.00E-04	NA	0.2	0.5	0.14	1	5.58	3.06E+05
Prometon	1610180	2.20E-02	NA	NA	NA	NA	0.2	1	0.1	1	2.99	870
Propachlor	1918167	1.30E-02	NA	NA	NA	NA	0.2	1	0.1	1	2.01	94.6
Propazine	139402	2.70E-02	NA	NA	NA	NA	0.2	1	0.1	1	2.75	505
Propionic acid	79094	1.70E+00	NA	3.00E+02	NA	NA	0.2	1	0.1	1	0.28	1.89
Propyl alcohol (I)	71238	1.90E-01	NA	7.30E+02	NA	6.14E+05	0.2	1	0.1	1	0.25	1.89
n-Propylbenzene (I)	103651	1.10E-02	NA	2.00E+01	NA	NA	0.2	1	0.1	1	3.69	4,240
Propylene glycol	57556	2.00E+01	NA	6.00E+03	NA	NA	0.2	1	0.1	1	-0.92	0.125
Pyrene	129000	7.50E-02	NA	1.00E+02	NA	NA	0.2	0.5	0.1	1	5.11	1.06E+05
Pyridine (I)	110861	1.00E-03	NA	3.50E+00	NA	NA	0.2	1	0.1	1	0.67	4.56
Selenium (B)	7782492	5.00E-03	NA	2.00E+00	NA	NA	0.2	0.5	0.01	1	NR	NR
Silver (B)	7440224	4.70E-03	NA	1.00E-01	NA	NA	0.2	0.5	0.01	1	NR	NR
Silvex (2,4,5-TP)	93721	7.50E-03	NA	NA	NA	NA	0.2	1	0.1	1	3.4	2,200
Simazine	122349	5.20E-03	NA	NA	NA	NA	0.2	1	0.1	1	1.93	79
Sodium	17341252	3.40E+01	NA	NA	NA	NA	0.1	0.5	0.01	1	NR	NR
Sodium azide	26628228	1.20E-02	NA	NA	NA	NA	0.2	1	0.1	1	NA	NA
Strontium (B)	7440246	6.30E-01	NA	NA	NA	NA	0.2	0.5	0.01	1	NR	NR
Styrene	100425	2.00E-01	1.30E-02	1.00E+03	5.70E-07	1.70E+05	0.2	1	0.1	1	2.94	777
Sulfate	14808798	NA	NA	NA	NA	NA	NA	0.5	0.1	1	NR	NR

Tebuthiuron	34014181	7.00E-02	NA	NA	NA	NA	0.2	1	0.1	1	1.78	56.2
2,3,7,8-Tetrabromodibenzo-p-dioxin (O)	50585416	NA	7.50E+04	NA	NA	NA	0.2	0.5	0.03	1	7.24	1.31E+07
1,2,4,5-Tetrachlorobenzene	95943	3.40E-01	NA	1.00E+00	NA	NA	0.2	1	0.1	1	4.64	36,400
2,3,7,8-Tetrachlorodibenzo-p-dioxin (O)	1746016	NA	7.50E+04	2.00E-06	4.40E+01	NA	0.2	0.5	0.03	1	7.04	8.33E+06
1,1,1,2-Tetrachloroethane	630206	8.90E-02	1.10E-02	NA	7.40E-06	NA	0.2	1	0.1	1	2.63	145

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			Kd	HLC	D _i or D _a or D ^{air}	D _w	LEL	FP	S		MW
		L/kg	L/kg	atm-m ³ /mol	cm ² /s	cm ² /s	unitless	°F	ug/L	unitless	g/mol
Phthalic anhydride	85449	NR	NR	1.63E-08	0.08	8.00E-06	1.70E+07	305	6.20E+06	Liquid	148.1
Picloram	1918021	NR	NR	4.05E-11	0.08	8.00E-06	NA	NA	4.30E+05	Solid	241.48
Piperidine	110894	NR	NR	4.45E-06	0.08	8.00E-06	NA	NA	1.00E+09	Liquid	85.15
Polybrominated biphenyls (J)	67774327	NR	NR	3.90E-06	0.08	8.00E-06	NA	NA	1.66E+07	Solid	NA
Polychlorinated biphenyls (PCBs) (J,T)	1336363	NR	NR	4.20E-04	0.08	8.00E-06	NA	NA	44.7	Solid	268.4
Prometon	1610180	NR	NR	1.98E-09	0.08	8.00E-06	NA	NA	7.50E+05	Solid	225.29
Propachlor	1918167	NR	NR	1.09E-07	0.08	8.00E-06	NA	NA	6.55E+05	Solid	211.69
Propazine	139402	NR	NR	4.60E-09	0.08	8.00E-06	NA	NA	8,600	Solid	229.75
Propionic acid	79094	NR	NR	4.45E-07	0.08	8.00E-06	0.029	126	1.00E+09	Liquid	74.09
Propyl alcohol (I)	71238	NR	NR	7.41E-06	0.08	8.00E-06	0.022	72	1.00E+09	Liquid	60.11
n-Propylbenzene (I)	103651	NR	NR	NA	0.08	8.00E-06	NA	NA	NA	Liquid	120.19
Propylene glycol	57556	NR	NR	1.24E-08	0.08	8.00E-06	NA	NA	1.00E+09	Liquid	76.1
Pyrene	129000	NR	NR	1.10E-05	0.0272	7.24E-06	NA	NA	135	Solid	202.26
Pyridine (I)	110861	NR	NR	7.00E-03	0.091	7.60E-06	0.018	68	3.00E+05	Liquid	79.11
Selenium (B)	7782492	NR	5	NR	NR	NR	NA	NA	NA	Inorganic	78.96
Silver (B)	7440224	NR	8.3	NR	NR	NR	NA	NA	NA	Inorganic	107.868
Silvex (2,4,5-TP)	93721	NR	NR	1.30E-08	0.08	8.00E-06	NA	NA	1.40E+05	Solid	269.51
Simazine	122349	NR	NR	3.37E-09	0.08	8.00E-06	NA	NA	4,470	Solid	201.67
Sodium	17341252	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	23
Sodium azide	26628228	NR	NA	NA	0.08	8.00E-06	NA	NA	NA	Solid	65.01

Strontium (B)	7440246	NR	NA	NR	NA	NA	NA	NA	NA	Inorganic	87.62
Styrene	100425	NR	NR	2.75E-03	0.071	8.00E-06	0.009	88	3.10E+05	Liquid	104.15
Sulfate	14808798	NR	NA	NR	0.08	8.00E-06	NA	NA	NA	Inorganic	96.066
Tebuthiuron	34014181	NR	NR	2.40E-10	0.08	8.00E-06	NA	NA	2.50E+06	Solid	228.31
2,3,7,8-Tetrabromodibenzo-p-dioxin (O)	50585416	NR	NR	2.95E-07	0.08	8.00E-06	NA	NA	0.00996	Solid	499.6
1,2,4,5-Tetrachlorobenzene	95943	NR	NR	1.20E-03	0.08	8.00E-06	NA	NA	1,300	Solid	215.28
2,3,7,8-Tetrachlorodibenzo-p-dioxin (O)	1746016	NR	NR	9.20E-06	0.047	8.00E-06	NA	NA	0.019	Solid	322
1,1,1,2-Tetrachloroethane	630206	NR	NR	2.40E-03	0.071	7.90E-06	NA	NA	1.10E+06	Liquid	167.85

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Hazardous Substance	Chemical Abstract Service Number	Oral Reference Dose	Oral Slope Factor	Chronic Inhalation Reference Concentration	Inhalation Unit Risk Factor	Occupational Short Term Exposure Level	Relative Source Contribution for Drinking Water	Ingestion Absorption Efficiency	Dermal Absorption Efficiency	Relative Source Contribution for Soil	Log Octanol-Water Partition Coefficient	Soil Organic Carbon-Water Partition Coefficients for Organic Compounds
		RfD	SF	RfC	IURF	STEL	RSC	AEi	AEd	RSC	Log Kow	Koc
		mg/kg-day	(mg/kg-day) ⁻¹	ug/m ³	(ug/m ³) ⁻¹	ug/m ³	unitless	unitless	unitless	unitless	unitless	L/kg
1,1,2,2-Tetrachloroethane	79345	NA	1.00E-01	NA	5.80E-05	NA	0.2	1	0.1	1	2.39	93.5
Tetrachloroethylene	127184	1.00E-02	2.60E-02	4.00E+01	5.80E-07	6.85E+05	0.2	1	0.1	1	2.67	156
Tetrahydrofuran	109999	1.30E-02	NA	5.90E+03	2.00E-06	7.37E+05	0.2	1	0.1	1	0.46	2.83
Tetranitromethane	509148	NA	NA	4.00E-01	1.50E-02	NA	0.2	NA	NA	1	-2.05	9.66E-03
Thallium (B)	7440280	6.70E-05	NA	0.2	NA	NA	0.2	0.5	0.01	1	NR	NR
Toluene (I)	108883	2.20E-01	NA	4.00E+02	NA	NA	0.2	1	0.1	1	2.75	180
p-Toluidine	106490	NA	5.60E-02	NA	3.10E-05	NA	0.2	1	0.1	1	1.39	23.3
Total dissolved solids (TDS)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NR
Toxaphene	8001352	NA	4.40E-01	NA	3.20E-04	1.00E+03	0.2	0.5	0.1	1	5.5	2.55E+05
Triallate	2303175	1.30E-02	NA	NA	NA	NA	0.2	1	0.1	1	4.57	31,100
Tributylamine	102829	3.50E-03	NA	7.00E+00	NA	NA	0.2	1	0.1	1	4.46	24,200
1,2,4-Trichlorobenzene	120821	1.50E-02	NA	3.70E+02	NA	3.70E+04	0.2	1	0.1	1	4.01	1,790
1,1,1-Trichloroethane	71556	2.20E+00	NA	1.00E+03	NA	2.46E+06	0.2	1	0.1	1	2.48	110
1,1,2-Trichloroethane	79005	3.90E-03	2.90E-02	NA	1.60E-05	NA	0.2	1	0.1	1	2.05	50.3
Trichloroethylene	79016	1.70E-03	1.00E-02	2.00E+00	1.70E-06	5.37E+05	0.2	1	0.1	1	2.71	168
Trichlorofluoromethane	75694	3.50E-01	NA	5.62E+04	NA	5.62E+06	0.2	1	0.1	1	2.53	121
2,4,5-Trichlorophenol	95954	1.00E-01	NA	3.50E+02	NA	NA	0.2	1	0.1	1	3.9	1,597

2,4,6-Trichlorophenol	88062	NA	7.40E-03	NA	3.10E-06	NA	0.2	1	0.1	1	3.7	381
1,2,3-Trichloropropane	96184	5.70E-03	NA	0.3	NA	NA	0.2	1	0.1	1	2.26	167
1,1,2-Trichloro-1,2,2-trifluoroethane	76131	2.70E+01	NA	7.67E+04	NA	9.59E+06	0.2	1	0.1	1	3.15	1,250
Triethanolamine	102716	5.00E-01	NA	5.00E+01	NA	NA	0.2	1	0.1	1	-1.38	0.044
Triethylene glycol	112276	5.90E-01	NA	NA	NA	NA	0.2	1	0.1	1	-1.69	0.0218
3-Trifluoromethyl-4-nitrophenol	88302	6.20E-01	NA	NA	NA	NA	0.2	1	0.1	1	2.87	663
Trifluralin	1582098	5.10E-03	4.50E-03	NA	NA	NA	0.2	0.5	0.1	1	5.3	1.62E+05
2,2,4-Trimethyl pentane	540841	NA	NA	3.50E+03	NA	NA	0.2	1	0.1	1	4.09	2,080
2,4,4-Trimethyl-2-pentene (I)	107404	NA	NA	NA	NA	NA	0.2	1	0.1	1	4	1,760
1,2,4-Trimethylbenzene (I)	95636	1.40E-01	NA	1.23E+03	NA	NA	0.2	1	0.1	1	3.67	965
1,3,5-Trimethylbenzene (I)	108678	1.40E-01	NA	1.23E+03	NA	NA	0.2	1	0.1	1	3.5	708

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Hazardous Substance	Chemical Abstract Service Number	Soil Koc for Ionizing Organic Compounds at pH=6.8	Soil-Water Distribution Coefficients for Inorganic Compounds at pH=6.8	Henry's Law Constant at 25°C	Air Diffusivity	Water Diffusivity	Lower Explosive Limit in Air	Flash Point	Water Solubility	Physical State at Standard Temperature and Pressure	Molecular Weight
			Kd	HLC	D _i or D _a or D ^{air}	D _w	LEL	FP	S		MW
		L/kg	L/kg	atm-m ³ /mol	cm ² /s	cm ² /s	unitless	°F	ug/L	unitless	g/mol
1,1,2,2-Tetrachloroethane	79345	NR	NR	3.45E-04	0.071	7.90E-06	NA	NA	2.97E+06	Liquid	167.85
Tetrachloroethylene	127184	NR	NR	1.84E-02	0.072	8.20E-06	NA	NA	2.00E+05	Liquid	165.83
Tetrahydrofuran	109999	NR	NR	9.63E-03	0.08	8.00E-06	0.02	6	1.00E+09	Liquid	72.12
Tetranitromethane	509148	NR	NR	2.60E-05	0.08	8.00E-06	NA	NA	85,000	Liquid	196.03
Thallium (B)	7440280	NR	71	NR	NR	NR	NA	NA	NA	Inorganic	204.383
Toluene (I)	108883	NR	NR	6.64E-03	0.087	8.60E-06	0.011	40	5.26E+05	Liquid	92.14
p-Toluidine	106490	NR	NR	6.10E-06	0.08	8.00E-06	NA	188	7.60E+06	Liquid	107.17
Total dissolved solids (TDS)	NA	NR	NA	NR	NA	NA	NA	NA	NA	NA	NA
Toxaphene	8001352	NR	NR	6.00E-06	0.0116	4.34E-06	NA	NA	740	Solid	414
Triallate	2303175	NR	NR	1.93E-05	0.08	8.00E-06	NA	NA	4,000	Liquid	304.66
Tributylamine	102829	NR	NR	5.60E-03	0.08	8.00E-06	NA	NA	75,400	Liquid	185.4
1,2,4-Trichlorobenzene	120821	NR	NR	1.42E-03	0.03	8.23E-06	NA	222	3.00E+05	Liquid	181.45
1,1,1-Trichloroethane	71556	NR	NR	1.72E-02	0.078	8.80E-06	0.075	NA	1.33E+06	Liquid	133.4
1,1,2-Trichloroethane	79005	NR	NR	9.13E-04	0.078	8.80E-06	0.06	NA	4.42E+06	Liquid	133.4
Trichloroethylene	79016	NR	NR	1.03E-02	0.079	9.10E-06	0.08	NA	1.10E+06	Liquid	131.39

Trichlorofluoromethane	75694	NR	NR	1.30E-01	0.087	9.70E-06	NA	NA	1.10E+06	Liquid	137.38
2,4,5-Trichlorophenol	95954	1,597	NR	4.33E-06	0.0291	7.03E-06	NA	NA	1.20E+06	Solid	197.5
2,4,6-Trichlorophenol	88062	381	NR	7.79E-06	0.0318	6.25E-06	NA	NA	8.00E+05	Solid	197.5
1,2,3-Trichloropropane	96184	NR	NR	3.80E-04	0.071	7.90E-06	NA	160	1.90E+06	Liquid	147.43
1,1,2-Trichloro-1,2,2-trifluoroethane	76131	NR	NR	5.30E-01	0.078	8.20E-06	NA	NA	1.70E+05	Liquid	187.38
Triethanolamine	102716	NR	NR	3.38E-19	0.08	8.00E-06	NA	NA	1.00E+09	Liquid	149.19
Triethylene glycol	112276	NR	NR	2.61E-10	0.0427	8.06E-06	NA	NA	1.00E+06	Liquid	150.17
3-Trifluoromethyl-4-nitrophenol	88302	NR	NR	1.92E-08	0.08	8.00E-06	NA	NA	5.00E+06	Solid	207
Trifluralin	1582098	NR	NR	2.60E-05	0.08	8.00E-06	NA	NA	8,100	Solid	335.29
2,2,4-Trimethyl pentane	540841	NR	NR	3.13E+00	0.08	8.00E-06	0.011	10	2,330	Liquid	114.23
2,4,4-Trimethyl-2-pentene (I)	107404	NR	NR	8.81E-01	0.08	8.00E-06	NA	NA	11,900	Liquid	112.2
1,2,4-Trimethylbenzene (I)	95636	NR	NR	5.87E-03	0.08	8.00E-06	0.009	112	55,890	Liquid	120.2
1,3,5-Trimethylbenzene (I)	108678	NR	NR	7.38E-03	0.08	8.00E-06	NA	122	61,150	Liquid	120.2

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		RfD	SF	RfC	IURF	STEL	RSC	AEi	AEd	RSC	Log Kow	Koc
		mg/kg-day	(mg/kg-day) ⁻¹	ug/m ³	(ug/m ³) ⁻¹	ug/m ³	unitless	unitless	unitless	unitless	unitless	L/kg
Triphenyl phosphate	115866	1.60E-01	NA	NA	NA	NA	0.2	1	0.1	1	4.67	39,000
tris(2,3-Dibromopropyl)phosphate	126727	NA	1.20E+00	NA	5.30E-04	NA	0.2	1	0.1	1	3.51	2,820
Urea	57136	NA	NA	NA	NA	NA	0.2	1	0.1	1	-2.11	0.0256
Vanadium	7440622	5.00E-03	NA	NA	NA	NA	0.2	0.5	0.01	1	NR	NR
Vinyl acetate (I)	108054	8.80E-02	NA	2.00E+02	NA	5.30E+04	0.2	1	0.1	1	0.73	5.22
Vinyl chloride	75014	3.00E-03	1.40E+00	1.00E+02	8.80E-06	NA	0.2	1	0.1	1	1.5	18.5
White phosphorus (R)	12185103	1.50E-05	NA	NA	NA	NA	0.2	0.5	0.01	1	NR	NR
Xylenes (I)	1330207	1.80E+00	NA	4.40E+03	NA	6.51E+05	0.2	1	0.1	1	3.11	348
Zinc (B)	7440666	3.30E-01	NA	NA	NA	NA	0.2	0.5	0.01	1	NR	NR

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			Kd	HLC	D _i or D _a or D ^{air}	D _w	LEL	FP	S		MW
		L/kg	L/kg	atm-m ³ /mol	cm ² /s	cm ² /s	unitless	°F	ug/L	unitless	g/mol
Triphenyl phosphate	115866	NR	NR	3.60E-07	0.08	8.00E-06	NA	NA	1,430	Liquid	326.3
tris(2,3-Dibromopropyl)phosphate	126727	NR	NR	3.00E-05	0.08	8.00E-06	NA	NA	4,700	Liquid	697.67
Urea	57136	NR	NR	NR	0.08	8.00E-06	NA	NA	NA	Solid	60.07
Vanadium	7440622	NR	1,000	NR	NR	NR	NA	NA	NA	Inorganic	50.942
Vinyl acetate (I)	108054	NR	NR	5.11E-04	0.085	9.20E-06	0.026	18	2.00E+07	Liquid	86.09
Vinyl chloride	75014	NR	NR	2.70E-02	0.106	1.23E-05	0.036	NA	2.76E+06	Liquid	62.5
White phosphorus (R)	12185103	NR	NA	NR	NR	NR	NA	NA	NA	Inorganic	123.9
Xylenes (I)	1330207	NR	NR	6.04E-03	0.078	3.21E-05	NA	NA	1.86E+05	Liquid	106.17
Zinc (B)	7440666	NR	62	NR	NR	NR	NA	NA	NA	Inorganic	65.39

NOTICE OF PUBLIC HEARING

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
REMEDICATION AND REDEVELOPMENT DIVISION**

NOTICE OF PUBLIC HEARING

The Michigan Department of Environmental Quality (MDEQ), Remediation and Redevelopment Division (RRD), will conduct a public hearing on proposed administrative rules promulgated pursuant to Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). The rules are identified as R 299.1 – R 299.50. The purpose of the rules is to implement the December 2012 amendments to the NREPA. The MDEQ is required to evaluate and revise the cleanup criteria established under Section 20120a of the NREPA by December 31, 2013.

The public hearing will be held on Wednesday, November 13, 2013, from 2:30 p.m. until 4:30 p.m., in the Con Con Conference Room on the Atrium Level, Constitution Hall, 525 West Allegan Street, Lansing, Michigan.

Copies of the proposed rules (ORR 2013-056 EQ) can be downloaded via the Internet through the Office of Regulatory Reinvention at www.michigan.gov/orr. Copies of the rules may also be obtained by contacting the Lansing Central Office at:

Remediation and Redevelopment Division
Michigan Department of Environmental Quality
P.O. Box 30426
Lansing, Michigan 48909-7926
Phone: 517-284-5141
Fax: 517-241-9581
E-Mail: reisnerr@michigan.gov

All interested persons are invited to attend and present their views. It is requested that all statements be submitted in writing for the hearing record. Anyone unable to attend may submit comments in writing to the address above. Written comments must be received by 5:00 p.m. on November 13, 2013.

Persons needing accommodations for effective participation in the meeting should contact the RRD at 517-284-5141, one week in advance to request mobility, visual, hearing, or other assistance.

This notice of public hearing is given in accordance with Sections 41 and 42 of Michigan's Administrative Procedures Act, 1969 PA 306, Michigan Compiled Laws (MCL) 24.241 and 24.242. Administration of the rules is by authority conferred on the Director of the MDEQ by Sections 20104(1) and 20120a(18) of the NREPA, MCL 324.20104(1) and 324.20120a(18). These rules will become effective immediately after filing with the Secretary of State.

Robert Wagner, Chief
Remediation and Redevelopment Division

**CORRECTION OF OBVIOUS
ERRORS IN PUBLICATION**

MCL 24.256(1) states in part:

“Sec. 56. (1) The Office of Regulatory Reform shall perform the editorial work for the Michigan register and the Michigan Administrative Code and its annual supplement. The classification, arrangement, numbering, and indexing of rules shall be under the ownership and control of the Office of Regulatory Reform, shall be uniform, and shall conform as nearly as practicable to the classification, arrangement, numbering, and indexing of the compiled laws. The Office of Regulatory Reform may correct in the publications obvious errors in rules when requested by the promulgating agency to do so...”

**CORRECTION OF OBVIOUS
ERRORS IN PUBLICATION**

September 19, 2013

Deidre O'Berry
Office of Regulatory Reinvention
611 W. Ottawa – 2nd Floor
Lansing, MI 48909

RE: 2010-039 Natural River Zoning, R 281.51 – 281.395

Dear Ms. O'Berry:

The Department of Natural Resources has a rule set that was recently amended; however, a correction is needed to an obvious error and, under MCL 24.256(1), the Office of Regulatory Reform may obvious errors in rules when requested by the promulgating agency to do so.

The DNR requests a grammatical correction to Rule 281.60 (2b and d) as shown below:

R 281.60 Variances and variance hearings.

(2) The zoning review board or zoning administrator shall consider the following factors to determine if a practical difficulty exists in order to comply with these rules as specified in subrule (1) of this rule:

(a) A condition exists on the property that prevents the development standards from being met.

(b) The practical difficulty ~~can~~ **cannot** be overcome by some reasonable method other than a variance.

(c) If the practical difficulty cannot be overcome by some reasonable method other than a variance, the variance shall meet the standards to the greatest extent possible.

(d) The variance will **not** cause a substantial change in the character of the area.

(e) In view of the manner in which the practical difficulty arose, the interests of justice will be served by allowing the variance.

(f) The practical difficulty is due to circumstances which are unique to the subject property and not self created.

(g) The variance shall not result in an adverse effect on the environment.

Attached at pages 2 and 3 of this letter is R 281.60 in its entirety with the grammatical errors corrected. We would ask that you make this correction under MCL 24.256 and publish it in the Michigan Register and the Michigan Administrative Code.

If you have any questions about this transmittal, please contact me at 241-2328.

Sincerely,

LuAnn M. Klont, Regulatory Affairs Liaison

EMERGENCY RULES

MCL 24.248 states:

“Sec. 48. (1) If an agency finds that preservation of the public health, safety, or welfare requires promulgation of an emergency rule without following the notice and participation procedures required by sections 41 and 42 and states in the rule the agency's reasons for that finding, and the governor concurs in the finding of emergency, the agency may dispense with all or part of the procedures and file in the office of the secretary of state the copies prescribed by section 46 indorsed as an emergency rule, to 3 of which copies shall be attached the certificates prescribed by section 45 and the governor's certificate concurring in the finding of emergency. The emergency rule is effective on filing and remains in effect until a date fixed in the rule or 6 months after the date of its filing, whichever is earlier. The rule may be extended once for not more than 6 months by the filing of a governor's certificate of the need for the extension with the office of the secretary of state before expiration of the emergency rule. An emergency rule shall not be numbered and shall not be compiled in the Michigan Administrative Code, but shall be noted in the annual supplement to the code. The emergency rule shall be published in the Michigan register pursuant to section 8.

(2) If the agency desires to promulgate an identical or similar rule with an effectiveness beyond the final effective date of an emergency rule, the agency shall comply with the procedures prescribed by this act for the processing of a rule which is not an emergency rule. The rule shall be published in the Michigan register and in the code.”

EMERGENCY RULES

DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS

PHARMACY – PROGRAM FOR UTILIZATION OF UNUSED PRESCRIPTION DRUGS

EMERGENCY RULES

Filed with the Secretary of State on October 1, 2013

These rules take effect upon filing with the Secretary of State and shall remain in effect for 6 months.

(By authority conferred on the Department of Licensing and Regulatory Affairs by Section 17775 of 1978 PA 368, MCL 333.17775, and Executive Reorganization Order No. 2011-4, MCL 445.2030)

FINDING OF EMERGENCY

These rules are promulgated by the Department of Licensing and Regulatory Affairs to administer the unused prescription drug repository and distribution program, 2012 PA 383, MCL 333.17775, effective March 28, 2013. Under the program, unused or donated prescription drugs, other than controlled substances, from an eligible health facility or manufacturer may be transferred to a pharmacy or charitable clinic to be dispensed to eligible participants who lack health insurance or reasonable means to pay for prescriptions. Pharmacies and charitable clinics that participate in the program may also collect unwanted prescription drugs for destruction and disposal.

The act, specifically section 17775(12), requires the department, in consultation with the Board of Pharmacy, to promulgate emergency rules under the administrative procedures act on or before the expiration of 6 months after the effective date of the act to establish, implement, and administer the program.

Therefore, the Department of Licensing and Regulatory Affairs finds the statutory requirement included in section 17775(12) of the act requires promulgation of these emergency rules without following the notice and participation procedures required by sections 41 and 42 of 1969 PA 306, MCL 24.241 and 24.242.

Rule 1. Definitions.

As used in this part:

(a) "Charitable clinic" means a charitable nonprofit corporation or facility that meets all of the following requirements:

(i) Is organized as a not-for-profit corporation pursuant to the nonprofit corporation act, 1982 PA 162, MCL 450.2101 to 450.3192.

(ii) Holds a valid exemption from federal income taxation issued pursuant to section 501(a) of the internal revenue code, 26 USC 501.

(iii) Is listed as an exempt organization under section 501(c) of the internal revenue code, 26 USC 501.

(iv) Is organized under or operated as a part of a health facility or agency licensed under article 17 of the code.

(v) Provides on an outpatient basis for a period of less than 24 consecutive hours to persons not residing or confined at the facility advice, counseling, diagnosis, treatment, surgery, care, or services relating to the preservation or maintenance of health.

(vi) Has a licensed pharmacy.

(b) "Code" means 1978 PA 368, MCL 333.1101 to 333.25211.

(c) "Eligible facility" means a medical institution as that term is defined in R 338.486.

(d) "Department" means the department of department of licensing and regulatory affairs, bureau of health care services.

(e) "Eligible participant" means an individual who meets all of the following requirements:

(i) Is a resident of this state.

(ii) Is eligible to receive medicaid or medicare or has no health insurance and otherwise lacks reasonable means to purchase prescription drugs, as prescribed in these rules.

(f) "Health professional" means any of the following individuals licensed and authorized to prescribe and dispense drugs or to provide medical, dental, or other health-related diagnoses, care, or treatment within the scope of his or her professional license:

(i) A physician licensed to practice medicine or osteopathic medicine and surgery under part 170 or 175 of the code.

(ii) A physician's assistant licensed under part 170, 175, or 180 of the code.

(iii) A dentist licensed under part 166 of the code.

(iv) An optometrist licensed under part 174 of the code.

(v) A pharmacist licensed under part 177 of the code.

(vi) A podiatrist licensed under part 180 of the code.

(g) "Non-retrievable" means to permanently alter a drug's physical state, chemical state, or both, through irreversible means in order to render that drug unavailable and unusable for all practical purposes.

(h) "Program" means the statewide unused prescription drug repository and distribution program known as the program for utilization of unused prescription drugs that is established in section 17775 of the code.

(i) "Reverse distributor" means an entity that collects controlled or noncontrolled substances from a health facility or pharmacy and either returns them to the manufacturer or arranges for their disposal.

(j) "Unit dose package" means a package that contains a single dose drug with the name, strength, control number, and expiration date of that drug on the label.

(k) "Unit of issue package" means a package that provides multiple doses of the same drug, but each drug is individually separated and includes the name, lot number, and expiration date.

Rule 2. Eligibility criteria; pharmacy; charitable clinics; requirements; withdrawal.

(1) To be eligible for participation in the program, a pharmacy or charitable clinic shall comply with all applicable federal and state laws, including laws applicable to the storage and distribution of drugs and the appropriate licensure standards, and shall hold an active, nonrestricted, Michigan license in good standing.

(2) Participation in the program is voluntary.

(3) A pharmacy or charitable clinic may elect to participate in the program by providing, on a form provided by the department, written notification to the department of all of the following:

(a) The name, street address, and telephone number of the pharmacy or charitable clinic, and any Michigan license or registration number issued to the pharmacy or charitable clinic.

(b) For a charitable clinic, evidence that the charitable clinic meets the requirements defined in subdivision (a) of rule 1.

(c) The name and license number of the responsible pharmacist employed by or under contract with the pharmacy or charitable clinic.

(d) A statement signed and dated by the responsible pharmacist indicating that the pharmacy or charitable clinic meets the eligibility requirements under this rule and shall comply with the requirements of the program.

(4) A pharmacy or charitable clinic may withdraw from participation in the program at any time by providing written notice to the department on a form provided by the department. All of the following information shall be included on the notice of withdrawal form:

(a) Name, address, telephone number, and Michigan license or registration number of pharmacy or charitable clinic.

(b) Name and dated signature of the responsible pharmacist, attesting that the pharmacy or charitable clinic will no longer participate in the program.

(c) Date of withdrawal.

Rule 3. Eligible prescription drugs.

(1) All non-controlled prescription drugs, except those specified in rule 4, that have been approved for medical use in the United States, are listed in the United States pharmacopeia and the national formulary (usp-nf), and meet the criteria for donation established by these rules may be accepted for donation under the program.

(2) A new prescription may be transferred to another participating pharmacy or charitable clinic for dispensing.

Rule 4. Ineligible drugs; controlled substances prohibited.

(1) The following shall not be accepted for dispensing under the program:

(a) Controlled substances, as defined in article 7 of the code or by federal law.

(b) Expired prescription drugs.

(c) Drugs that may be dispensed only to a patient registered with the drug's manufacturer under federal food and drug administration requirements.

(d) Drugs that have been held outside of a health professional's control where sanitation and security cannot be assured.

(e) Compounded drugs.

(f) Drugs that require storage temperatures other than normal room temperature as specified by the manufacturer or the usp-nf shall not be donated or accepted as part of the program. Excluded from this restriction are drugs donated directly from a drug manufacturer.

(2) Controlled substances submitted for donation shall be documented and returned immediately to the eligible facility that donated the drugs. Both of the following apply:

(a) If controlled substances enter the participating pharmacy or charitable clinic and it is not possible or practicable to return the controlled substances to the donating facility, abandoned controlled substances shall be documented and destroyed pursuant to the protocols currently used by the pharmacy.

(b) A destruction record shall be created and maintained for a period of 5 years after destruction for any controlled substances destroyed.

Rule 5. Donated prescription drugs; participating pharmacy or charitable clinic requirements.

(1) A participating pharmacy or charitable clinic may accept a prescription drug only if all of the following requirements are met:

(a) The drug is in its original sealed and tamper-evident packaging. However, a drug in a single-unit dose, unit of issue package, or blister pack with the outside packaging opened may be accepted if the single-unit-dose packaging or unit of issue packaging is unopened.

(b) The drug has been stored according to manufacturer or usp-nf storage requirements.

(c) The packaging contains the lot number and expiration date of the drug. If the lot number is not retrievable, all specified medications shall be destroyed in the event of a recall.

(d) The drug has an expiration date that is more than 6 months after the date that the drug was donated.

(e) The drug does not have any physical signs of tampering or adulteration, and there is no reason to believe that the drug is adulterated.

(f) The packaging does not have any physical signs of tampering, deterioration, compromised integrity, or adulteration.

(2) A participating pharmacy or charitable clinic may accept donated prescription drugs from more than 1 eligible facility, provided that the donating is done pursuant to the terms of the program.

Rule 6. Donated prescription drugs; eligible facility requirements.

(1) An eligible facility or manufacturer may donate unused or donated prescription drugs, other than controlled substances, to a participating pharmacy or charitable clinic, if the drug meets the requirements of these rules.

(2) A manufacturer or its representative may donate prescription drugs in professional samples, other than controlled substances, to a charitable clinic under the program, if the drug meets the requirements of these rules.

Rule 7. Resident of an eligible facility; donations permitted.

(1) A resident of an eligible facility or the representative or guardian of a resident of an eligible facility may donate unused prescription drugs to be dispensed under the terms of the program.

(2) A resident of an eligible facility or the resident's representative or guardian shall complete a resident donation form prior to the eligible facility taking possession of the drugs to be donated. A copy of the resident donation form shall be sent to the participating pharmacy or charitable clinic with the donated drugs.

(3) The prescription drugs donated under the method described in this rule shall have originated from the eligible facility, prescription drugs obtained prior to the resident being admitted to the facility shall not be accepted.

(4) The prescription drugs donated under the method described in this rule are subject to all the requirements of these rules.

Rule 8. Transfer and shipment of donated drugs; requirements.

(1) Prior to the initial transfer of donated drugs from an eligible facility or manufacturer to a participating pharmacy or charitable clinic, the eligible facility or manufacturer shall complete the eligible facility donation form. The eligible facility or manufacturer shall transmit the completed eligible facility donation form to the participating pharmacy or charitable clinic and retain a copy for its records.

(2) A completed transfer form shall be included in each shipment of donated drugs from an eligible facility or manufacturer to a participating pharmacy or charitable clinic.

(3) Donated drugs under the program shall be shipped from the eligible facility or manufacturer to the participating pharmacy or charitable clinic via common or contract carrier.

Rule 9. Inspection and storage of donated prescription drugs; destruction; recall.

(1) A licensed pharmacist employed by or under contract with the participating pharmacy or charitable clinic shall inspect donated prescription drugs to determine, in the professional judgment of the pharmacist, that the drugs are not adulterated, are safe and suitable for dispensing, and are eligible drugs. The pharmacist who inspects the drugs shall sign the transfer form included with the shipment of donated drugs attesting to the above.

(2) The participating pharmacy or charitable clinic shall store donated drugs pursuant to the manufacturer's guidelines or usp-nf guidelines. Donated drugs shall not be stored with non-donated inventory at any time.

(3) When donated drugs are not inspected immediately upon receipt, a participating pharmacy or charitable clinic shall quarantine the donated drugs separately from all dispensing stock until the donated drugs have been inspected and approved for dispensing under the program.

(4) A participating pharmacy or charitable clinic shall destroy donated prescription drugs that are not suitable for dispensing pursuant to protocols currently established by the pharmacy or charitable clinic for the destruction of prescription drugs.

(5) A destruction and disposal record shall be created and maintained for donated drugs that are destroyed and disposed of as a result of being expired, adulterated, recalled, or otherwise not eligible for dispensing. A participating pharmacy or charitable clinic shall maintain a destruction record for 5 years after destruction of the donated drugs.

(6) If a participating pharmacy or charitable clinic receives a recall notification, the participating pharmacy or charitable clinic shall perform a uniform destruction of all of the recalled prescription drugs in the participating pharmacy or charitable clinic and complete the destruction record for all donated drugs destroyed. The destruction shall be done pursuant to protocols currently established by the pharmacy or charitable clinic for the destruction and disposal of prescription drugs.

(7) If a recalled drug has been dispensed, the participating pharmacy or charitable clinic shall immediately notify the eligible participant of the recalled drug pursuant to established drug recall procedures.

Rule 10. Record keeping; inventory; requirements.

(1) A participating pharmacy or charitable clinic shall keep records in conformance with these rules and all applicable federal and state laws, rules, and regulations.

(2) A participating pharmacy or charitable clinic shall maintain documented policies and procedures that will address all the requirements of these rules.

(3) All of the following information shall be documented for each drug accepted for the program:

(a) Brand name or generic name of the drug.

(b) Name of the manufacturer or national drug code number (ndc#).

(c) Quantity and strength of the drug.

(d) Lot number of medication, if available.

(e) Expiration date of medication.

(f) Date the drug was donated and the date the drug was subsequently dispensed.

(g) Name of the eligible facility that donated the drug and the eligible participant subsequently dispensed the drug.

(h) The prescription from a health care professional.

(3) All records required for participation in the program shall be maintained separate from other records for 5 years and shall be readily retrievable for inspection at the request of the department or its agent.

Rule 11. Forms; eligible facility donation form, resident donation form, eligible participant form, transfer form, destruction form; requirements.

(1) An eligible facility donation form shall include all of the following information:

(a) An eligible facility's or manufacturer's name, address, and telephone number; the name, dated signature, and license number of pharmacist or health care provider authorized to donate the drugs; and, license number of the facility or manufacturer.

(b) A statement of the facility's intent to participate in the program and donate eligible prescription drugs to the participating pharmacy or charitable clinic identified on the form.

(c) The receiving participating pharmacy's or charitable clinic's name, address, and telephone number.

(d) The name, Michigan license number, and dated signature of the responsible pharmacist authorized to receive the donation.

(e) The date the donation was received.

(2) A resident donation form shall include all of the following information:

(a) The eligible facility's name, address, Michigan license or registration number, and telephone number; and the name, dated signature, and license number of pharmacist or health care provider authorized to donate the drugs.

(b) The resident's name and dated signature, or the name and dated signature of the resident's representative or guardian.

(c) Attestation to the following statement, "As the legal owner of the listed prescription drug(s), I agree to voluntarily donate the listed eligible unused drugs to the program for utilization of unused prescription drugs."

(d) The drug brand name or generic name, the name of manufacturer or national drug code number (ndc#), the quantity and strength of the drug, and the drug's expiration date.

(e) The date of the donation.

(f) The name, address, telephone number and Michigan license or registration number of the pharmacy or charitable clinic receiving donated unused prescription drug.

(g) The date the donated drugs are received by the pharmacy or charitable clinic.

(h) The name, Michigan license or registration number, and dated signature of the authorized pharmacist or health care provider receiving the donated prescription drug.

(3) The eligible participant form shall include all of the following information:

(a) The participating pharmacy's or charitable clinic's name, address, telephone number, Michigan license or registration number, and the name, Michigan license or registration number, and dated signature of dispensing pharmacist.

(b) The drug's brand name or generic name, the name of manufacturer or national drug code number (ndc#), the quantity and strength of the drug, the date the drug was dispensed, and the drug's expiration date.

(c) The eligible participant's name, date of birth, address and dated signature.

(d) Attestation of all of the following:

(i) The eligible participant is a resident of the state of Michigan.

(ii) The eligible participant is eligible to receive medicare or medicaid or is uninsured and does not have prescription drug coverage.

(e) The eligible participant acknowledges that the drugs have been donated.

(f) The eligible participant consents to a waiver of the requirement for child resistant packaging, as required by the poison prevention packaging act, being 15 U.S.C. §1471-1477.

(4) The transfer form shall include all of the following information:

(a) The eligible facility or manufacturer's name, Michigan license or registration number, address, telephone number, and the name, dated signature, and Michigan license number of responsible pharmacist.

(b) The date of donation.

(c) The drug's brand name or generic name, the name of manufacturer or national drug code number (ndc#), quantity and strength of the drug, and the drug's expiration date.

(d) The pharmacist of the eligible facility or manufacturer shall attest to the following statement, "I certify that the prescription drugs listed on this form for donation are eligible for donation and meet the requirements for prescription drugs under the program, including any storage requirements."

(e) The receiving participating pharmacy's or charitable clinic's name, address, and telephone number, and name and Michigan license number of responsible pharmacist authorized to receive the donation.

(f) The responsible pharmacist shall sign and date the transfer form attesting to the following statement, "Upon receipt and inspection of the above listed donated prescription drugs, it is in my professional judgment that these drugs are not adulterated, are safe and suitable for dispensing, and are eligible drugs."

(5) The destruction form shall include all of the following:

(a) The participating pharmacy's or charitable clinic's name, Michigan license number, address, and telephone number, and the name, dated signature, and license number of the responsible pharmacist.

(b) The drug's brand name or generic name, the name of the manufacturer or national drug code number (ndc#), the quantity and strength of the drug, and the drug's expiration date.

(c) The reason for destruction of the drug.

(d) The name, title, and dated signature of the witness.

(e) The date of destruction.

(f) If off-site disposal is used, the name of the firm destroying or disposing the drug, the name and dated signature of the person at the firm destroying or disposing the drug, and the date of disposal.

(6) All forms required for participation in the program shall be maintained separate from other records for 5 years and shall be readily retrievable for inspection at the request of the department or its agent.

(7) The department shall make available all forms required by the program. The forms shall be available at no cost from the Department of Licensing and Regulatory Affairs, Bureau of Health Care Services, 611 W. Ottawa St., Lansing, MI 48909 or on the department's website at www.michigan.gov/healthlicense.

Rule 12. Eligible participants; requirements.

The eligible participant shall complete the recipient form attesting to the following statements:

(a) The eligible participant is eligible to receive medicare or medicaid or does not have insurance or prescription drug coverage. Verification or written documentation shall not be required.

(b) The eligible participant acknowledges that the drugs have been donated.

(c) The eligible participant consents to a waiver of the requirement for child resistant packaging, as required by the poison prevention packaging act, 15 U.S.C. §1471–1477.

Rule 13. Dispensing donated prescription drugs; requirements.

(1) A participating pharmacy or charitable clinic shall dispense donated prescription drugs in compliance with applicable federal and state laws and regulations for dispensing prescription drugs, including all requirements relating to packaging, labeling, record keeping, drug utilization review, and patient counseling.

(3) The department and a local participating pharmacy or charitable clinic shall remove any patient identifying information from the package prior to dispensing the drugs.

(4) Prescription drugs donated under this program shall not be resold; however, a participating pharmacy or charitable clinic may collect a handling fee pursuant to the terms of Rule 14.

Rule 14. Handling fee.

(1) A participating pharmacy or charitable clinic may charge the eligible participant of a donated drug a handling fee, not to exceed a maximum of 300% of the medicaid standard pharmacy dispensing fee as established by the Michigan department of community health, to cover stocking and dispensing costs.

(2) A copy of the medicaid drug dispensing fees can be obtained from the Michigan department of community health, 201 Townsend Street, Lansing, Michigan 48913 or on the department's website at http://www.michigan.gov/mdch/0,1607,7-132-2945_42542_42543_42546_42551-151019--,00.html.

(3) A prescription drug dispensed through the program shall not be eligible for reimbursement under the medical assistance program.

Rule 15. Donation to other participating pharmacy or charitable clinic.

(1) The originating participating pharmacy or charitable clinic may donate drugs donated under this program to other participating pharmacies or charitable clinics for use pursuant to the program. The participating pharmacy or charitable clinic donating the drugs shall complete a transfer form.

Rule 16. Registry; creation.

The department shall establish and maintain a participating pharmacy and charitable clinic registry for the program on the department's website. The registry shall include the participating pharmacy's or charitable clinic's name, address, and telephone number, and the contact name of the responsible pharmacist.

Rule 17. Collection of prescription drugs and other medication for destruction and disposal; requirements; limitations.

(1) Pursuant to section 17776 of the code, a participating pharmacy or charitable clinic shall accept from any person a prescription drug or any other medication that is ineligible for distribution under the program for destruction and disposal.

(2) Controlled substances shall not be collected by a participating pharmacy or charitable clinic for destruction and disposal, unless permitted by federal law.

(3) The collection shall occur on-site at the participating pharmacy or charitable clinic and according to the requirements set forth in these rules and all applicable state and federal laws and regulations.

Rule 18. Collection device; requirements.

(1) A participating pharmacy or charitable clinic shall utilize a collection device to collect prescription drugs and other medications that are ineligible for distribution under the program for destruction and disposal that meets all of the following criteria:

(a) The collection device is designed to allow contents to be added to the device but not removed, except by authorized personnel for the purpose of destruction and disposal.

(b) The collection device shall be lined with a removable liner that is waterproof, tamper-evident, tear resistant and capable of being sealed. The contents of the liner shall not be viewable from the outside and the size or capacity of the liner shall be clearly marked on the outside of the liner.

(c) The collection device is secured in a manner that will only allow authorized personnel to remove the contents of the container for the purpose of destruction and disposal.

(d) The collection device utilizes a design that is tamper resistant and is securely locked.

(e) The collection device shall be securely fastened to permanent structure within the designated pharmacy area so that it cannot be removed.

(f) The collection device shall be consistently monitored by security features and pharmacy personnel.

(g) The following statement shall be prominently placed on the collection device and shall be posted as signage near the location of the collection device, “Controlled substances cannot be accepted for destruction and disposal, unless permitted under federal law.”

Rule 19. Destruction of collected drugs; methods; access.

(1) Destruction of collected drugs shall occur through 1 of the following methods:

(a) On-site at the participating pharmacy or charitable clinic. The method of the on-site destruction shall be sufficient to render the prescription drugs non-retrievable to prevent diversion and to protect the public health and safety. On-site destruction shall occur immediately after the contents are removed from the collection device.

(b) Off-site, through a contract with a reverse distributor. The participating pharmacy or charitable clinic may contract with a reverse distributor to facilitate the destruction and disposal of drugs collected under the program. Off-site destruction shall occur not more than 7 days after the contents have been removed from the collection device.

(2) Only personnel designated by the participating pharmacy or charitable clinic shall have access to the collection device to remove the contents for on-site destruction or to transfer the contents to the party performing the destruction and disposal services.

(3) The collection device shall be accessed only to remove the contents for destruction in a manner consistent with these rules.

(4) Two authorized personnel, 1 of whom shall be a licensed pharmacist, shall access the collection device to remove the contents for destruction. The liner containing the contents shall be sealed immediately upon removal and the weight shall be recorded on the destruction and disposal log. The destruction and disposal log shall be completed at the time the collection receptacle is accessed.

(5) If the contents of the collection receptacle are going to be transferred to a reverse distributor for destruction, a copy of the destruction log shall be included with the sealed contents.

Rule 20. Record keeping; policy and procedures; destruction and disposal log.

(1) In addition to the policy and procedure requirements in Rule 9 and Rule 10, a participating pharmacy or charitable clinic shall maintain a destruction and disposal log that includes all of the following information:

(a) Name, telephone number, address, and Michigan license or registration number of the participating pharmacy or charitable clinic.

(b) Date, time, weight of the contents of the collection receptacle and method of destruction utilized each time the contents of the collection receptacle are removed for destruction.

(2) Copies of all contracts with reverse distributors shall be stored with the destruction log, as applicable.

Rule 21. Transportation.

(1) If it is necessary to transport the contents of the collection device to the location of the reverse distributor for the destruction and disposal, the transportation shall be done through a common carrier and in manner that allows the shipment to be tracked and delivery confirmed.

(2) Utilization of a vehicle or mode of transportation that is primarily used by the participating pharmacy or charitable clinic for business or personal purposes is prohibited.

Rule 22. Department of human services and department of community health; inclusion in rule-making process.

The department shall notify the director of the department of human services and the director of the department of community health of an approved request for rule-making under MCL 24.239 for rule promulgation affecting eligible facilities or mental health or substance abuse clients. The department of human services and the department of community health shall provide any input regarding the rule promulgation to the department within 30 days of receipt of notification of the approved request for rule-making.

DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS

Steve Arwood, Director

CONCURRENCE OF THE GOVERNOR

Pursuant to Section 48(1) of 1969 PA 306, MCL 24.248(1), I hereby concur in the finding of the Department of Licensing and Regulatory Affairs that circumstances creating an emergency have occurred and the public interest requires the promulgation of the following rule(s).

Rick Snyder, Governor

Date

MICHIGAN ADMINISTRATIVE CODE TABLE
(2013 SESSION)

MCL 24.208 states in part:

“Sec. 8. (1) The Office of Regulatory Reform shall publish the Michigan register at least once each month. The Michigan register shall contain all of the following:

* * *

(i) Other official information considered necessary or appropriate by the Office of Regulatory Reform.”

The following table cites administrative rules promulgated during the year 2000, and indicates the effect of these rules on the Michigan Administrative Code (1979 ed.).

MICHIGAN ADMINISTRATIVE CODE TABLE
(2013 RULE FILINGS)

R Number	Action	2013 MR Issue	R Number	Action	2013 MR Issue	R Number	Action	2013 MR Issue
28.14965	R	19	54.213	A	12	123.47	R	10
29.2901	A	5	123.1	*	10	123.66	R	10
29.2902	A	5	123.4	*	10	123.67	R	10
29.2903	A	5	123.21	*	10	123.68	R	10
29.2904	A	5	123.22	*	10	123.69	R	10
29.2905	A	5	123.23	*	10	123.71	R	10
29.2906	A	5	123.24	*	10	123.72	R	10
29.2907	A	5	123.43	*	10	123.73	R	10
29.2908	A	5	123.44	*	10	123.74	R	10
29.2909	A	5	123.51	*	10	123.75	R	10
29.2910	A	5	123.52	*	10	205.5	R	8
29.2911	A	5	123.53	*	10	205.9	R	8
29.2912	A	5	123.54	*	10	205.23	R	8
29.2913	A	5	123.55	*	10	205.1	*	8
29.2914	A	5	123.61	*	10	205.8	*	8
29.2915	A	5	123.62	*	10	205.15	*	8
29.2916	A	5	123.63	*	10	205.16	*	8
29.2917	A	5	123.64	*	10	205.20	*	8
29.2918	A	5	123.65	*	10	205.22	*	8
29.2919	A	5	123.20	A	10	205.26	*	8
29.2920	A	5	123.30	A	10	205.28	*	8
29.2921	A	5	123.31	A	10	205.136	*	8
29.2922	A	5	123.32	A	10	205.1101	R	6
29.2923	A	5	123.33	A	10	205.1111	R	6
29.2924	A	5	123.34	A	10	205.1115	R	6
29.2925	A	5	123.35	A	10	205.1120	R	6
29.2926	A	5	123.36	A	10	205.1125	R	6
54.201	*	12	123.37	A	10	205.1130	R	6
54.202	*	12	123.38	A	10	205.1135	R	6
54.203	*	12	123.40	A	10	205.1140	R	6
54.204	*	12	123.56	A	10	205.1145	R	6
54.205	*	12	123.6	R	10	205.1150	R	6
54.206	*	12	123.25	R	10	205.1155	R	6
54.207	*	12	123.26	R	10	205.1201	R	6
54.208	*	12	123.27	R	10	205.1202	R	6
54.209	*	12	123.41	R	10	205.1205	R	6
54.210	*	12	123.42	R	10	205.1208	R	6
54.211	A	12	123.45	R	10	205.1210	R	6
54.212	A	12	123.46	R	10	205.1215	R	6

(* Amendment to Rule, **A** Added Rule, **N** New Rule, **R** Rescinded Rule)

R Number	Action	2013 MR Issue	R Number	Action	2013 MR Issue	R Number	Action	2013 MR Issue
205.1220	R	6	205.1342	R	6	281.71	A	18
205.1222	R	6	205.1345	R	6	281.80	A	18
205.1225	R	6	205.1348	R	6	281.81	A	18
205.1228	R	6	209.1	*	5	281.90	A	18
205.1230	R	6	209.31	*	5	281.91	A	18
205.1235	R	6	257.1604	A	11	281.100	A	18
205.1240	R	6	257.16910	*	11	281.110	A	18
205.1245	R	6	281.51	*	18	281.120	A	18
205.1247	R	6	281.53	*	18	281.121	A	18
205.1249	R	6	281.54	*	18	281.130	A	18
205.1250	R	6	281.55	*	18	281.150	A	18
205.1252	R	6	281.56	*	18	281.170	A	18
205.1255	R	6	281.57	*	18	281.190	A	18
205.1257	R	6	281.58	*	18	281.191	A	18
205.1260	R	6	281.59	*	18	281.200	A	18
205.1264	R	6	281.60	*	18	281.220	A	18
205.1270	R	6	281.61	*	18	281.52	R	18
205.1275	R	6	281.101	*	18	281.102	R	18
205.1278	R	6	281.110	*	18	281.103	R	18
205.1280	R	6	281.111	*	18	281.104	R	18
205.1281	R	6	281.131	*	18	281.105	R	18
205.1283	R	6	281.140	*	18	281.106	R	18
205.1285	R	6	281.141	*	18	281.107	R	18
205.1288	R	6	281.151	*	18	281.108	R	18
205.1290	R	6	281.160	*	18	281.109	R	18
205.1301	R	6	281.161	*	18	281.112	R	18
205.1303	R	6	281.171	*	18	281.113	R	18
205.1305	R	6	281.180	*	18	281.114	R	18
205.1307	R	6	281.181	*	18	281.132	R	18
205.1312	R	6	281.201	*	18	281.133	R	18
205.1313	R	6	281.210	*	18	281.134	R	18
205.1315	R	6	281.211	*	18	281.135	R	18
205.1317	R	6	281.221	*	18	281.136	R	18
205.1320	R	6	281.62	A	18	281.137	R	18
205.1330	R	6	281.63	A	18	281.138	R	18
205.1332	R	6	281.64	A	18	281.139	R	18
205.1333	R	6	281.65	A	18	281.142	R	18
205.1335	R	6	281.66	A	18	281.143	R	18
205.1340	R	6	281.70	A	18	281.144	R	18

(* Amendment to Rule, **A** Added Rule, **N** New Rule, **R** Rescinded Rule)

R Number	Action	2013 MR Issue	R Number	Action	2013 MR Issue	R Number	Action	2013 MR Issue
281.145	R	18	281.227	R	18	281.324	R	18
281.152	R	18	281.228	R	18	281.325	R	18
281.153	R	18	281.229	R	18	281.326	R	18
281.154	R	18	281.230	R	18	281.327	R	18
281.155	R	18	281.231	R	18	281.328	R	18
281.156	R	18	281.232	R	18	281.329	R	18
281.157	R	18	281.233	R	18	281.330	R	18
281.158	R	18	281.234	R	18	281.331	R	18
281.159	R	18	281.251	R	18	281.332	R	18
281.162	R	18	281.252	R	18	281.333	R	18
281.163	R	18	281.253	R	18	281.334	R	18
281.164	R	18	281.254	R	18	281.341	R	18
281.172	R	18	281.255	R	18	281.342	R	18
281.173	R	18	281.256	R	18	281.343	R	18
281.174	R	18	281.257	R	18	281.344	R	18
281.175	R	18	281.258	R	18	281.345	R	18
281.176	R	18	281.259	R	18	281.346	R	18
281.177	R	18	281.260	R	18	281.347	R	18
281.178	R	18	281.261	R	18	281.348	R	18
281.179	R	18	281.262	R	18	281.349	R	18
281.182	R	18	281.263	R	18	281.350	R	18
281.183	R	18	281.264	R	18	281.351	R	18
281.184	R	18	281.271	R	18	281.352	R	18
281.202	R	18	281.272	R	18	281.353	R	18
281.203	R	18	281.273	R	18	281.354	R	18
281.204	R	18	281.274	R	18	281.355	R	18
281.205	R	18	281.275	R	18	281.361	R	18
281.206	R	18	281.276	R	18	281.362	R	18
281.207	R	18	281.277	R	18	281.363	R	18
281.208	R	18	281.278	R	18	281.364	R	18
281.209	R	18	281.279	R	18	281.365	R	18
281.212	R	18	281.280	R	18	281.366	R	18
281.213	R	18	281.281	R	18	281.367	R	18
281.214	R	18	281.282	R	18	281.368	R	18
281.222	R	18	281.283	R	18	281.369	R	18
281.223	R	18	281.284	R	18	281.370	R	18
281.224	R	18	281.321	R	18	281.371	R	18
281.225	R	18	281.322	R	18	281.372	R	18
281.226	R	18	281.323	R	18	281.373	R	18

(* Amendment to Rule, **A** Added Rule, **N** New Rule, **R** Rescinded Rule)

R Number	Action	2013 MR Issue	R Number	Action	2013 MR Issue	R Number	Action	2013 MR Issue
281.374	R	18	299.3315	R	2	323.3002	R	16
281.375	R	18	299.3316	R	2	323.3003	R	16
281.381	R	18	299.3317	R	2	323.3004	R	16
281.382	R	18	299.3318	R	2	323.3005	R	16
281.383	R	18	299.3319	R	2	323.3006	R	16
281.384	R	18	299.5105	R	2	323.3007	R	16
281.385	R	18	299.5107	R	2	323.3008	R	16
281.386	R	18	299.5109	R	2	323.3009	R	16
281.387	R	18	299.5111	R	2	323.3010	R	16
281.388	R	18	299.5113	R	2	323.3011	R	16
281.389	R	18	299.5117	R	2	323.3012	R	16
281.390	R	18	299.5401	R	2	323.3013	R	16
281.391	R	18	299.5403	R	2	323.3014	R	16
281.392	R	18	299.5405	R	2	323.3015	R	16
281.393	R	18	299.5407	R	2	323.3016	R	16
281.394	R	18	299.5409	R	2	323.3017	R	16
281.395	R	18	299.5411	R	2	323.3018	R	16
281.663.1	R	11	299.5413	R	2	323.3019	R	16
281.1201	*	11	299.5415	R	2	323.3020	R	16
281.1204	*	11	299.5530	R	2	323.3021	R	16
281.1206	*	11	299.5532	R	2	323.3022	R	16
281.1208	*	11	299.5534	R	2	323.3023	R	16
285.138.1	R	5	299.5536	R	2	323.3024	R	16
285.502.1	R	10	299.5538	R	2	323.3025	R	16
287.71	R	17	299.5540	R	2	323.3026	R	16
299.3301	R	2	299.5732	R	2	323.3027	R	16
299.3302	R	2	299.5742	R	2	324.1501	R	2
299.3303	R	2	299.5901	R	2	324.1502	R	2
299.3304	R	2	299.5903	R	2	324.1503	R	2
299.3305	R	2	299.5905	R	2	324.1504	R	2
299.3306	R	2	299.5907	R	2	324.1505	R	2
299.3307	R	2	299.5909	R	2	324.1506	R	2
299.3308	R	2	299.5911	R	2	324.1507	R	2
299.3309	R	2	299.5913	R	2	324.1508	R	2
299.3310	R	2	299.5915	R	2	324.1509	R	2
299.3311	R	2	299.5917	R	2	324.1509a	R	2
299.3312	R	2	299.5919	R	2	324.1510	R	2
299.3313	R	2	308.1	R	17	324.1511	R	2
299.3314	R	2	323.3001	R	16	324.14501	*	18

(* Amendment to Rule, **A** Added Rule, **N** New Rule, **R** Rescinded Rule)

R Number	Action	2013 MR Issue	R Number	Action	2013 MR Issue	R Number	Action	2013 MR Issue
324.14503	*	18	325.5635	A	8	325.5632	R	8
324.14504	*	18	325.5357	A	8	325.5633	R	8
324.14505	*	18	325.5658	A	8	325.5638	R	8
324.14506	*	18	325.5667	A	8	325.5639	R	8
324.14507	*	18	325.5668	A	8	325.5640	R	8
324.14508	*	18	325.5674	A	8	325.5641	R	8
325.3802	*	18	325.5675	A	8	325.5642	R	8
325.3815	*	18	325.5676	A	8	325.5643	R	8
325.3826	*	18	325.5677	A	8	325.5644	R	8
325.3832	*	18	325.5678	A	8	325.5645	R	8
325.3837	*	18	325.5679	A	8	325.5646	R	8
325.3847	*	18	325.5680	A	8	325.5647	R	8
325.3855	*	18	325.5681	A	8	325.5648	R	8
325.3856	*	18	325.5682	A	8	325.5649	R	8
325.3857	*	18	325.5683	A	8	325.5650	R	8
325.3858	*	18	325.5684	A	8	325.5651	R	8
325.3867	*	18	325.5685	A	8	325.5652	R	8
325.3868a	*	18	325.5686	A	8	325.5659	R	8
328.3874	*	18	325.5687	A	8	325.5660	R	8
325.5601	*	8	325.5688	A	8	325.5661	R	8
325.5602	*	8	325.5689	A	8	325.5662	R	8
325.5603	*	8	325.5690	A	8	325.5663	R	8
325.5605	*	8	325.5691	A	8	325.5664	R	8
325.5607	*	8	325.5692	A	8	325.5665	R	8
325.5608	*	8	325.5693	A	8	325.6001	R	18
325.5610	*	8	325.5694	A	8	325.6002	R	18
325.5611	*	8	325.5695	A	8	325.18301	*	18
325.5612	*	8	325.5696	A	8	325.18302	*	18
325.5613	*	8	325.5697	A	8	325.18303	A	18
325.5637	*	8	325.5698	A	8	325.35001	*	18
325.5655	*	8	325.5617	R	8	325.35002	*	18
325.5656	*	8	325.5618	R	8	325.35003	*	18
325.5601a	A	8	325.5619	R	8	325.35004	*	18
325.5626	A	8	325.5621	R	8	325.35005	*	18
325.5627	A	8	325.5622	R	8	325.35007	*	18
325.5628	A	8	325.5623	R	8	325.35008	*	18
325.5629	A	8	325.5624	R	8	325.35009	*	18
325.5630	A	8	325.5625	R	8	325.35011	*	18
325.5634	A	8	325.5631	R	8	325.35002a	A	18

(* Amendment to Rule, **A** Added Rule, **N** New Rule, **R** Rescinded Rule)

R Number	Action	2013 MR Issue	R Number	Action	2013 MR Issue	R Number	Action	2013 MR Issue
325.35006a	A	18	325.50305	R	7	325.50344	R	7
325.35010	R	18	325.50306	R	7	325.50345	R	7
325.47801	R	11	325.50307	R	7	325.50346	R	7
325.50101	*	18	325.50308	R	7	325.50347	R	7
325.50102	*	18	325.50309	R	7	325.50348	R	7
325.50105	*	18	325.50310	R	7	325.51101	*	6
325.50106	*	18	325.50311	R	7	325.51105	*	6
325.50107	*	18	325.50312	R	7	325.51108	*	6
325.50108	*	18	325.50313	R	7	325.51101a	A	6
325.50109	*	18	325.50314	R	7	325.51190	*	7
325.50110	*	18	325.50315	R	7	325.51143	R	7
325.50111	*	18	325.50316	R	7	325.51301	*	11
325.50114	*	18	325.50317	R	7	325.51302	*	11
325.50115	*	18	325.50318	R	7	325.51311	*	11
325.50116	*	18	325.50319	R	7	325.51312	*	11
325.50117	*	18	325.50320	R	7	325.51401	*	18
325.50118	*	18	325.50321	R	7	325.51402	*	18
325.50119	*	18	325.50322	R	7	325.51404	*	18
325.50121	*	18	325.50323	R	7	325.51405	*	18
325.50123	*	18	325.50324	R	7	325.51406	*	18
325.50124	*	18	325.50325	R	7	325.51407	*	18
325.50125	*	18	325.50326	R	7	325.51409	*	18
325.50128	*	18	325.50327	R	7	325.51411	*	18
325.50129	*	18	325.50328	R	7	325.51412	*	18
325.50130	*	18	325.50329	R	7	325.51413	*	18
325.50131	*	18	325.50330	R	7	325.51414	*	18
325.50132	*	18	325.50331	R	7	325.51401a	A	18
325.50133	*	18	325.50332	R	7	325.51411a	A	18
325.50134	*	18	325.50333	R	7	325.51651	*	18
325.50135	*	18	325.50334	R	7	325.51652	*	18
325.50100	A	18	325.50335	R	7	325.51653	A	18
325.50102a	A	18	325.50336	R	7	325.51851	*	10
325.50106a	A	18	325.50337	R	7	325.51852	*	10
325.50129a	A	18	325.50338	R	7	325.51854	*	10
325.5014	R	18	325.50339	R	7	325.51856	*	10
325.50301	*	7	325.50340	R	7	325.51859	*	10
325.50303	*	7	325.50341	R	7	325.51860	*	10
325.50304	*	7	325.50342	R	7	325.51862	*	10
325.50302	R	7	325.50343	R	7	325.51863	*	10

(* Amendment to Rule, **A** Added Rule, **N** New Rule, **R** Rescinded Rule)

R Number	Action	2013 MR Issue	R Number	Action	2013 MR Issue	R Number	Action	2013 MR Issue
325.51865	*	10	340.1721b	*	18	338.3232	R	5
325.51866	*	10	340.1721e	*	18	338.3233	R	5
325.51867	*	10	340.1722	*	18	338.3234	R	5
325.51868	*	10	340.1724f	*	18	338.3235	R	5
325.51869	*	10	340.1725f	*	18	338.3236	R	5
325.51873	*	10	340.1732	*	18	338.3238	R	5
325.51874	*	10	340.1734	*	18	338.3239	R	5
325.51879	*	10	340.1738	*	18	338.3241	R	5
325.51880	*	10	340.1748	*	18	338.3242	R	5
325.51881	*	10	340.1749a	*	18	338.3243	R	5
325.51883	*	10	340.1749b	*	18	338.3251	R	5
325.51851a	A	10	340.1754	*	18	338.3252	R	5
325.51878a	A	10	340.1755	*	18	338.3253	R	5
325.51885	R	10	340.1758	*	18	338.3254	R	5
325.51886	R	10	340.1781	*	18	338.3255	A	5
325.60151	*	6	340.1790	*	18	338.3256	A	5
325.60154	*	6	340.1796	*	18	338.3257	R	5
325.60155	*	6	340.1798	*	18	338.3258	R	5
325.60156	*	6	340.1799c	*	18	338.3259	R	5
325.60157	*	6	340.1799g	*	18	338.3261	R	5
325.60158	*	6	340.1802	*	18	338.3262	R	5
325.60159	*	6	340.1809	*	18	338.3263	R	5
325.60160	*	6	340.1811	*	18	338.3264	R	5
325.60161	*	6	340.1831	*	18	338.3265	R	5
325.60151a	A	6	340.1839	*	18	338.3266	R	5
333.101	*	19	340.1851	*	18	338.3267	R	5
333.103	*	19	340.1862	*	18	338.3268	R	5
333.113	*	19	338.7	*	6	338.3269	R	5
333.117	*	19	338.108	R	6	338.3270	R	5
333.121	*	19	338.3201	R	5	338.3281	R	5
333.125	*	19	338.3202	R	5	338.3282	R	5
333.127	*	19	338.3204	R	5	338.3283	R	5
336.1310	*	6	338.3206	R	5	338.3284	R	5
336.1330	R	6	338.3208	R	5	338.3291	R	5
338.2506	*	19	338.3218	R	5	338.3292	R	5
340.1701	*	18	338.3219	R	5	338.3295	R	5
340.1701a	*	18	338.3220	R	5	338.3301	R	5
340.1702	*	18	338.3221	R	5	338.3302	R	5
340.1721	*	18	338.3231	R	5	338.3303	R	5

(* Amendment to Rule, **A** Added Rule, **N** New Rule, **R** Rescinded Rule)

R Number	Action	2013 MR Issue	R Number	Action	2013 MR Issue	R Number	Action	2013 MR Issue
338.3304	R	5	338.5405	*	12	339.17509	A	19
338.3307	R	5	338.5435	*	12	339.22501	R	5
338.3311	R	5	338.5460	*	12	339.22503	R	5
338.3312	R	5	338.5465	*	12	339.22505	R	5
338.3313	R	5	338.5475	*	12	339.22507	R	5
338.3314	R	5	338.5501	*	12	339.22509	R	5
338.3317	R	5	338.5503	*	12	339.22511	R	5
338.3321	R	5	338.5116	A	12	339.22513	R	5
338.3324	R	5	338.5117	A	12	339.22515	R	5
338.3327	R	5	338.5139	A	12	339.22517	R	5
338.3331	R	5	338.5103	R	12	339.22519	R	5
338.3332	R	5	338.5105	R	12	339.22521	R	5
338.3335	R	5	338.5114	R	12	339.22523	R	5
338.3341	R	5	338.5120	R	12	339.22525	R	5
338.3345	R	5	338.5145	R	12	339.22527	R	5
338.3451	R	5	338.5260	R	12	339.22529	R	5
338.3455	R	5	338.5270	R	12	339.23101	*	5
338.3456	R	5	338.5446	R	12	339.23102	*	5
338.3461	R	5	338.5480	R	12	340.1121	*	6
338.3463	R	5	338.23030	R	6	340.1122	*	6
338.3464	R	5	339.15101	*	19	340.1123	R	6
338.3465	R	5	339.15501	A	19	340.1124	R	6
338.3466	R	5	339.15502	A	19	390.67100	R	9
338.5101	*	12	339.15503	A	19	400.400	R	6
338.5102	*	12	339.15504	A	19	400.410	R	6
338.5104	*	12	339.15505	A	19	400.411	R	6
338.5110	*	12	339.15506	A	19	400.5101	R	13
338.5110a	*	12	339.15507	A	19	400.5102	R	13
338.5111	*	12	339.16001	*	19	400.5102a	R	13
338.5112	*	12	339.16040	A	19	400.5103	R	13
338.5115	*	12	339.16041	A	19	400.5103a	R	13
338.5140	*	12	339.16042	A	19	400.5104	R	13
338.5210	*	12	339.16043	A	19	400.5104a	R	13
338.5217	*	12	339.16044	A	19	400.5104b	R	13
338.5218	*	12	339.17101	*	19	400.5105	R	13
338.5230	*	12	339.17505	A	19	400.5106	R	13
338.5240	*	12	339.17506	A	19	400.5107	R	13
338.5255	*	12	339.17507	A	19	400.5108	R	13
338.5401	*	12	339.17508	A	19	400.5109	R	13

(* Amendment to Rule, **A** Added Rule, **N** New Rule, **R** Rescinded Rule)

R Number	Action	2013 MR Issue	R Number	Action	2013 MR Issue	R Number	Action	2013 MR Issue
400.5109a	R	13	400.5604	R	13	400.8104	A	13
400.5110	R	13	400.5605	R	13	400.8107	A	13
400.5111	R	13	400.5606	R	13	400.8110	A	13
400.5111a	R	13	400.5607	R	13	400.8113	A	13
400.5111b	R	13	400.5610	R	13	400.8116	A	13
400.5113a	R	13	400.5611	R	13	400.8119	A	13
400.5113b	R	13	400.5613	R	13	400.8122	A	13
400.5113c	R	13	400.5615	R	13	400.8125	A	13
400.5114	R	13	400.5801	R	13	400.8128	A	13
400.5115	R	13	400.5805	R	13	400.8131	A	13
400.5116	R	13	400.5810	R	13	400.8134	A	13
400.5117	R	13	400.5815	R	13	400.8137	A	13
400.5118	R	13	400.5820	R	13	400.8140	A	13
400.5201a	R	13	400.5825	R	13	400.8143	A	13
400.5201b	R	13	400.5835	R	13	400.8146	A	13
400.5202a	R	13	400.5840	R	13	400.8149	A	13
400.5204	R	13	400.5841	R	13	400.8152	A	13
400.5204a	R	13	400.5845	R	13	400.8155	A	13
400.5205	R	13	400.5850	R	13	400.8158	A	13
400.5205a	R	13	400.5856	R	13	400.8161	A	13
400.5205b	R	13	400.5865	R	13	400.8164	A	13
400.5206	R	13	400.5870	R	13	400.8167	A	13
400.5209	R	13	400.5900a	R	13	400.8170	A	13
400.5301	R	13	400.5901	R	13	400.8173	A	13
400.5302	R	13	400.5902	R	13	400.8176	A	13
400.5303	R	13	400.5902a	R	13	400.8179	A	13
400.5303a	R	13	400.5902b	R	13	400.8182	A	13
400.5305	R	13	400.5902c	R	13	400.8185	A	13
400.5306	R	13	400.5902d	R	13	400.8188	A	13
400.5307	R	13	400.5903	R	13	400.8191	A	13
400.5501	R	13	400.5905	R	13	400.8301	A	13
400.5502	R	13	400.5910	R	13	400.8305	A	13
400.5502a	R	13	400.5915	R	13	400.8310	A	13
400.5502b	R	13	400.5920	R	13	400.8315	A	13
400.5502c	R	13	400.5925	R	13	400.8320	A	13
400.5601	R	13	400.5930	R	13	400.8325	A	13
400.5602	R	13	400.5935	R	13	400.8330	A	13
400.5603	R	13	400.5940	R	13	400.8335	A	13
400.5604	R	13	400.8101	A	13	400.8340	A	13

(* Amendment to Rule, **A** Added Rule, **N** New Rule, **R** Rescinded Rule)

R Number	Action	2013 MR Issue	R Number	Action	2013 MR Issue	R Number	Action	2013 MR Issue
400.8345	A	13	408.59	*	5	408.11807	*	10
400.8350	A	13	408.10413	R	1	408.11844	*	10
400.8355	A	13	408.10421	*	1	408.11851	*	10
400.8360	A	13	408.10509	*	1	408.11859	*	10
400.8365	A	13	408.10541	*	1	408.11913	*	16
400.8370	A	13	408.10570	*	1	408.11921	*	16
400.8375	A	13	408.10579	*	1	408.11937	*	16
400.8380	A	13	408.10580	*	1	408.11957	*	16
400.8385	A	13	408.10582	*	1	408.11902	A	16
400.8501	A	13	408.10590	*	1	408.12011	*	18
400.8505	A	13	408.10761	R	1	408.12016	*	18
400.8510	A	13	408.10763	R	1	408.12021	*	18
400.8515	A	13	408.10765	*	1	408.12026	*	18
400.8520	A	13	408.10801	*	1	408.12043	*	18
400.8525	A	13	408.10807	*	1	408.12002	A	18
400.8530	A	13	408.10823	*	1	408.12111	*	10
400.8535	A	13	408.10914	*	1	408.12151	*	10
400.8540	A	13	408.10925	*	1	408.12155	*	10
400.8545	A	13	408.10999	*	1	408.12163	*	10
400.8550	A	13	408.11119	R	10	408.12216	*	7
400.8555	A	13	408.11121	R	10	408.12217	*	7
400.8560	A	13	408.11203	*	11	408.12218	*	7
400.8565	A	13	408.11211	*	11	408.12220	*	7
400.8701	A	13	408.11213	*	11	408.12242	*	7
400.8710	A	13	408.11221	*	11	408.12202	A	7
400.8720	A	13	408.11222	*	11	408.12231	R	7
400.8730	A	13	408.11224	*	11	408.13811	*	7
400.8740	A	13	408.11241	*	11	408.13812	*	7
400.8750	A	13	408.11243	*	11	408.13822	*	7
400.8760	A	13	408.11262	*	11	408.13847	*	7
400.8770	A	13	408.11275	*	11	408.13865	*	7
400.8801	A	13	408.11293	*	11	408.13871	*	7
400.8810	A	13	408.11294	*	11	408.13881	*	7
400.8820	A	13	408.11202	A	11	408.13802	A	7
400.8830	A	13	408.11432	*	6	408.14246	*	6
400.8840	A	13	408.11431	R	6	408.14263	*	6
408.43b	*	9	408.11434	R	6	408.14267	*	6
408.43i	*	9	408.11724	*	6	408.14269	*	6
408.48	*	5	408.11725	*	6	408.14273	*	6

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408.14231	R	6	408.17213	*	10	408.30001	*	6
408.14451	*	8	408.17222	*	10	408.30002	A	6
408.14476	*	8	408.17225	*	10	408.30007	*	6
408.14507	*	10	408.17236	*	10	408.30013	*	6
408.14521	*	10	408.17251	*	10	408.30016	*	6
408.14555	*	10	408.17227	R	10	408.30019	*	6
408.14535	R	10	408.17303	*	8	408.30022	*	6
408.15712	*	8	408.17310	*	8	408.30025	*	6
408.15713	*	8	408.17315	*	8	408.30028	*	6
408.15717	*	8	408.17318	*	8	408.30031	*	6
408.15721	*	8	408.17320	*	8	408.30034	*	6
408.15723	*	8	408.17403	*	8	408.30037	*	6
408.15725	*	8	408.17404	*	8	408.30040	*	6
408.15726	*	8	408.17405	*	8	408.30043	*	6
408.15739	*	8	408.17411	*	8	408.30046	*	6
408.15802	*	8	408.17412	*	8	408.30049	*	6
408.15810	*	8	408.17415	*	8	408.30052	*	6
408.15815	*	8	408.17421	*	8	408.30055	*	6
408.15821	*	8	408.17422	*	8	408.30701	*	18
408.15831	*	8	408.17423	*	8	408.30711	*	18
408.15833	*	8	408.17424	*	8	408.30715	*	18
408.15817	*	18	408.17426	*	8	408.30717	*	18
408.15825	*	18	408.17431	*	8	408.30719	*	18
408.15231	*	18	408.17432	*	8	408.30720	*	18
408.15233	*	18	408.17433	*	8	408.30721	*	18
408.15836	*	18	408.17434	*	8	408.30722	*	18
408.15839	*	18	408.17435	*	8	408.30723	*	18
408.15811	R	18	408.17436	*	8	408.30724	*	18
408.15812	R	18	408.17437	*	8	408.30725c	*	18
408.16211	*	10	408.17451	*	8	408.30728	*	18
408.16222	*	10	408.17461	*	8	408.30741c	*	18
408.16227	*	10	408.17463	*	8	408.30749	*	18
408.16236	*	10	408.17421	*	11	408.30753a	*	18
408.16217	R	10	408.17461	*	11	408.30754a	*	18
408.16511	*	6	408.17501	*	18	408.30754b	*	18
408.16528	*	6	408.17502	A	18	408.30757	*	18
408.17125	R	6	408.19101	*	18	408.30758	*	18
408.17211	*	10	408.19102	*	18	408.30786	*	18
408.17212	*	10	408.19103	A	18	408.30791	*	18

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408.30792	*	18	408.30948	*	10	408.40743	*	6
408.30763a	A	18	408.30995a	*	10	408.40744	*	6
408.30757a	A	18	408.30947a	A	10	408.40746	*	6
408.30801	*	10	408.30948a	A	10	408.40751	*	6
408.30806	*	10	408.30996	A	10	408.40761	*	6
408.30808	*	10	408.40102	*	6	408.40714	R	6
408.30810	*	10	408.40114	*	6	408.40729	R	6
408.30811	*	10	408.40116	*	6	408.40742	R	6
408.30812	*	10	408.40119	*	6	408.40810	*	7
408.30815	*	10	408.40121	*	6	408.40818	*	7
408.30817	*	10	408.40122	*	6	408.40819	*	7
408.30818	*	10	408.40127	*	6	408.40820	*	7
408.30819	*	10	408.40128	*	6	408.40821	*	7
408.30822	*	10	408.40130	*	6	408.40822	*	7
408.30823	*	10	408.40131	*	6	408.40831	*	7
408.30826	*	10	408.40132	*	6	408.40833	*	7
408.30827	*	10	408.40133	*	6	408.40834	*	7
408.30835	*	10	408.40134	*	6	408.40836	*	7
408.30838	*	10	408.40133	R	6	408.40837	*	7
408.30865	*	10	408.40125	R	6	408.40840	*	7
408.30869	*	10	408.40126	R	6	408.40841	*	7
408.30870	*	10	408.40617	*	6	408.40932	*	6
408.30871	*	10	408.40621	*	6	408.40933	*	6
408.30873	*	10	408.40622	*	6	408.40941	*	6
408.30872	R	10	408.40623	*	6	408.40851	*	6
408.30880	R	10	408.40624	*	6	408.40946	R	6
408.30901a	*	10	408.40625	*	6	408.40952	R	6
408.30906a	*	10	408.40626	*	6	408.41111	*	7
408.30910a	*	10	408.40631	*	6	408.41122	*	7
408.30912a	*	10	408.40634	*	6	408.41123	*	7
408.30915a	*	10	408.40635	*	6	408.41124	*	7
408.30918a	*	10	408.40627	R	6	408.41126	*	7
408.30923a	*	10	408.40632	R	6	408.41132	*	7
408.30927a	*	10	408.40641	R	6	408.41133	*	7
408.30928a	*	10	408.40709	*	6	408.41140	*	7
408.30935a	*	10	408.40711	*	6	408.41102	R	7
408.30945a	*	10	408.40712	*	6	408.41115	R	7
408.30946	*	10	408.40721	*	6	408.41125	R	7
408.30947	*	10	408.40722	*	6	408.41130	R	7

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408.41131	R	7	408.41476	*	8	408.41971	R	7
408.41210	*	7	408.41477	*	8	408.41974	R	7
408.41211	*	7	408.41478	*	8	408.41975	R	7
408.41215	*	7	408.41482	*	8	408.41979	R	7
408.41217	*	7	408.41075a	A	8	408.42031	*	6
408.41221	*	7	408.41077a	A	8	408.42034	*	6
408.41222	*	7	408.41468	R	8	408.42041	*	6
408.41224	*	7	408.41610	*	1	408.42043	*	6
408.41225	*	7	408.41627	*	1	408.42045	*	6
408.41226	*	7	408.41633	*	1	408.42046	*	6
408.41227	*	7	408.41658	*	1	408.42047	*	6
408.41231	*	7	408.41719	*	1	408.42131	R	1
408.41232	*	7	408.41725	*	1	408.42145	R	1
408.41233	*	7	408.41728	*	1	408.42149	*	1
408.41234	*	7	408.41802	*	7	408.42156	*	1
408.41235	*	7	408.41841	*	7	408.42157	*	1
408.41236	*	7	408.41852	*	7	408.42159	*	1
408.41237	*	7	408.41872	*	7	408.42160	R	1
408.41243	*	7	408.41884	*	7	408.42209	*	8
408.41245	*	7	408.41842	R	7	408.42213	*	8
408.41253	*	7	408.41850	R	7	408.42223	*	8
408.41254	*	7	408.41932	*	7	408.42225	*	8
408.41255	*	7	408.41934	*	7	408.42238	*	8
408.41256	*	7	408.41935	*	7	408.42402	*	1
408.41261	*	7	408.41943	*	7	408.42403	*	1
408.41264	*	7	408.41945	*	7	408.42404	*	1
408.41228	R	7	408.41949	*	7	408.42405	*	1
408.41244	R	7	408.41952	*	7	408.42406	*	1
408.41246	R	7	408.41953	*	7	408.42407	*	1
408.41262	R	7	408.41954	*	7	408.42502	*	1
408.41263	R	7	408.41957	*	7	408.42503	*	1
408.41410	*	8	408.41959	*	7	408.42518	*	1
408.41462	*	8	408.41964	*	7	408.42520	*	1
408.41464	*	8	408.41977	*	7	408.42521	*	1
408.41465	*	8	408.41980	*	7	408.42522	*	1
408.41466	*	8	408.41902	A	7	408.42524	*	1
408.41467	*	8	408.41931	R	7	408.42525	*	1
408.41472	*	8	408.41956	R	7	408.42526	*	1
408.41475	*	8	408.41970	R	7	408.42527	*	1

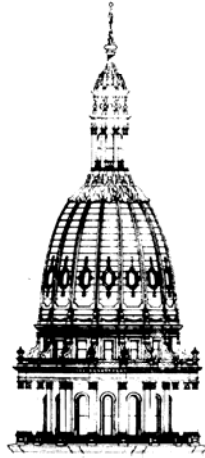
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408.42531	*	1	408.43145	R	7	484.89	*	8
408.42532	*	1	408.43146	R	7	484.90	*	8
408.42533	*	1	408.43151	R	7	490.113	R	11
408.42534	R	1	408.43152	R	7	490.114	R	11
408.42535	R	1	408.43153	R	7	490.117	R	11
408.42602	*	1	408.43154	R	7	490.118	R	11
408.42644	*	1	408.43155	R	7	491.101	R	3
408.42732	*	7	408.43156	R	7	491.110	R	3
408.42733	*	7	408.43157	R	7	491.115	R	3
408.42741	*	7	408.43158	R	7	491.120	R	3
408.42743	*	7	408.43161	R	7	491.125	R	3
408.42755	*	7	408.43162	R	7	491.130	R	3
408.42759	*	7	408.43204a	*	8	491.135	R	3
408.42799	*	7	408.43207	*	8	491.140	R	3
408.42756	R	7	408.43212	*	8	491.145	R	3
408.43101	R	7	408.43205	*	18	491.150	R	3
408.43103	R	7	408.43206	*	18	491.155	R	3
408.43104	R	7	408.43208	*	18	491.160	R	3
408.43105	R	7	408.43212	*	18	491.165	R	3
408.43106	R	7	408.43214	*	18	491.170	R	3
408.43107	R	7	408.43216	*	18	491.175	R	3
408.43109	R	7	408.43203	R	18	491.180	R	3
408.43111	R	7	432.2	*	10	491.185	R	3
408.43112	R	7	432.6	*	10	491.190	R	3
408.43113	R	7	436.1335	R	5	491.195	R	3
408.43114	R	7	460.813	*	19	491.197	R	3
408.43121	R	7	484.71	*	6	550.402	A	6
408.43122	R	7	484.72	*	6	550.403	A	6
408.43123	R	7	484.73	*	6	550.404	A	6
408.43124	R	7	484.74	*	6	554.701	*	9
408.43125	R	7	484.75	*	6	554.723	*	9
408.43126	R	7	484.81	*	8	554.731	*	9
408.43127	R	7	484.82	*	8	554.733	*	9
408.43131	R	7	484.83	*	8	554.734	*	9
408.43132	R	7	484.84	*	8	554.736	*	9
408.43133	R	7	484.85	*	8	554.737	*	9
408.43134	R	7	484.86	*	8	554.741	*	9
408.43141	R	7	484.87	*	8	554.742	*	9

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554.743	*	9	792.10265	A	6
554.744	*	9	792.10267	A	6
554.746	*	9	792.10269	A	6
554.721	R	9	792.10271	A	6
554.722	R	9	792.10273	A	6
554.747	R	9	792.10275	A	6
554.750	A	9	792.10277	A	6
554.751	A	9	792.10279	A	6
792.10201	A	6	792.10281	A	6
792.10203	A	6	792.10283	A	6
792.10205	A	6	792.10285	A	6
792.10207	A	6	792.10287	A	6
792.10209	A	6	792.10289	A	6
792.10211	A	6			
792.10213	A	6			
792.10215	A	6			
792.10217	A	6			
792.10219	A	6			
792.10221	A	6			
792.10223	A	6			
792.10225	A	6			
792.10227	A	6			
792.10229	A	6			
792.10231	A	6			
792.10233	A	6			
792.10237	A	6			
792.10239	A	6			
792.10241	A	6			
792.10243	A	6			
792.10245	A	6			
792.10247	A	6			
792.10249	A	6			
792.10251	A	6			
792.10253	A	6			
792.10255	A	6			
792.10257	A	6			
792.10259	A	6			
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Part 38 Hand and Portable Powered Tools (2013-7)
Part 42 Hazard Communication CS (2013-17*)
Part 42 Forging (2013-6)
Part 44 Foundries GI (2013-8)
Part 45 Die Casting GI (2013-10)
Part 49. Slings GI (2013-15*)
Part 57 Oil and Gas Drilling and Servicing Operations GI (2013-8)
Part 58 Aerial Work Platforms GI (2013-8)
Part 58 Aerial Work Platforms GI (2013-18)
Part 62 Plastic Molding GI (2013-10)
Part 65 Mills and Calendars for Rubber and Plastic (2013-6)
Part 71 Laundry and Dry Cleaning Machinery and Operations (2013-6)
Part 72 Automotive Service Operations GI (2013-10)
Part 73 Fire Brigades GI (2013-8)
Part 74 Fire Fighting GI (2013-8)
Part 74 Fire Fighting GI (2013-11)
Part 75 Flammable Liquids GI (2013-18)
Part 76 Spray Finishing using Flammable and Combustible Materials GI (2013-14)
Part 79 Diving Operations (2013-7)
Part 91 Process Safety Management of Highly Hazardous Chemicals GI (2013-18)
Part 92 Hazard Communication GI (2013-17*)
Part 301 Air Contaminants for General Industry (2013-6)
Part 302 Vinyl Chloride OH (2013-18)
Part 305 Asbestos Standards for General Industry OH (2013-11)
Part 308. Inorganic Arsenic OH (2013-15*)
Part 309 Cadmium OH (2013-10)
Part 312.1, 3 - Butadiene OH (2013-15*)
Part 313 Methylene Chloride OH (2013-18)
Part 314 Coke Oven Emissions OH (2013-18)
Part 350 Carcinogens OH (2013-18)
Part 430 Hazard Communication OH (2013-17*)
Part 431. Hazardous Work in Laboratory OH (2013-15*)
Part 432. Hazardous Waste Operations and Emergency Response OH (2013-15*)
Part 433. Personal Protection Equipment OH (2013-15*)
Part 451. Respiratory Protection (2013-19*)
Part 470 Employee Medical Records and Trade Secrets OH (2013-17*)
Part 478 Illumination OH (2013-11)
Part 504 Diving Operations (2013-7)
Part 511 Temporary Labor Camps (2013-7)
Part 591 Process Safety Management of Highly Hazardous Chemicals OH (2013-18)
Part 601 Air Contaminants for Construction (2013-6)
Part 602 Asbestos Standards for Construction OH (2013-11)
Part 603 Lead Exposure in Construction OH (2013-15*)
Pharmacy Controlled Animal Euthanasia (2013-12*)
Pharmacy Controlled Substances (2013-12*)
Pharmacy General Rules (2013-12*)

Plumbing Licensing Rules (2013-11*)
Professional Engineers – General Rules (2013-19)
Professional Surveyors – General Rules (2013-19)
Psychology – General Rules (2013-19)
Rehabilitation Code (2013-17*)
State Boundary Commission (2013-10)
Survey and Remonumentation (2013-12)
Tax Tribunal Rules of Practice and Procedure (2013-6)
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Natural River Zoning (2013-18)
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**ADMINISTRATIVE RULES
ENROLLED SENATE AND HOUSE BILLS
SIGNED INTO LAW OR VETOED
(2013 SESSION)**

Mich. Const. Art. IV, §33 provides: “Every bill passed by the legislature shall be presented to the governor before it becomes law, and the governor shall have 14 days measured in hours and minutes from the time of presentation in which to consider it. If he approves, he shall within that time sign and file it with the secretary of state and it shall become law . . . If he does not approve, and the legislature has within that time finally adjourned the session at which the bill was passed, it shall not become law. If he disapproves . . . he shall return it within such 14-day period with his objections, to the house in which it originated.”

Mich. Const. Art. IV, §27, further provides: “No act shall take effect until the expiration of 90 days from the end of the session at which it was passed, but the legislature may give immediate effect to acts by a two-thirds vote of the members elected to and serving in each house.”

MCL 24.208 states in part:

“Sec. 8. (1) The Office of Regulatory Reform shall publish the Michigan register at least once each month. The Michigan register shall contain all of the following:

* * *

(b) On a cumulative basis, the numbers and subject matter of the enrolled senate and house bills signed into law by the governor during the calendar year and the corresponding public act numbers.

(c) On a cumulative basis, the numbers and subject matter of the enrolled senate and house bills vetoed by the governor during the calendar year.”

2013 Michigan Public Acts Table

Legislative Service Bureau
Legal Division, Statutory Compiling and Law Publications Unit
124 W. Allegan, Lansing, MI 48909

October 24, 2013
Through PA 141 of 2013

PA No.	ENROLLED		I.E.* Yes/No	Governor Approved	Filed Date	Effective Date	SUBJECT
	HB	SB					
1	4153		Yes	3/12	3/12	3/12/13	Sales tax ; collections; retroactive effective date for regulations on prepaid sales tax on gasoline; provide for. (Rep. M. Shirkey)
2		044	Yes	3/12	3/12	6/1/13	Criminal procedure ; sex offender registration; placement on the public registry; remove certain exceptions. (Sen. R. Jones)
3		060	Yes	3/12	3/12	3/12/13	Weapons ; licensing; definition of federally licensed firearms dealer; modify. (Sen. M. Green)
4		061	Yes	3/18	3/18	3/18/13 #	Insurance ; health care corporations; merger of health care corporation with a nonprofit mutual disability insurer; allow, and provide procedures, prescribe requirements on rating and certain contract provisions, and establish requirements for a health endowment fund corporation. (Sen. J. Hune)
5		062	Yes	3/18	3/18	3/18/13 #	Insurance ; health; regulations applicable to nonprofit mutual disability insurer; revise to accommodate merger with nonprofit health care corporation and prescribe requirements on rating and certain contract provisions. (Sen. V. Smith)
6		0234	Yes	3/20	3/20	3/20/13 #	Vehicles ; fund-raising registration plates; fund-raising plate for ducks unlimited; provide for. (Sen. R. Richardville)
7	4337		Yes	3/20	3/20	3/20/13 #	Vehicles ; fund-raising registration plates; distribution of proceeds from sales of ducks unlimited fund-raising plates; provide for. (Rep. D. Zorn)
8		048	Yes	3/26	3/26	3/26/13	Animals ; other; exemption from large carnivore act for certain businesses; expand to exempt businesses that allow patrons to come into contact with bears less than 36 weeks of age or bears that weigh 90 pounds or less and make other general revisions. (Sen. T. Casperson)

* - I.E. means Legislature voted to give the Act immediate effect.

** - Act takes effect on the 91st day after sine die adjournment of the Legislature.

*** - See Act for applicable effective date.

+ - Line item veto.

++ - Pocket veto.

- Tie bar.

2013 Michigan Public Acts Table

PA No.	ENROLLED		I.E.* Yes/No	Governor Approved	Filed Date	Effective Date	SUBJECT
	HB	SB					
9		0233	Yes	3/27	3/27	3/27/13	Appropriations; supplemental ; various state departments and agencies; provide appropriations. (<i>Sen. D. Booher</i>)
10		0252	Yes	3/27	3/27	3/27/13	Watercraft; marinas ; marina dredging loan origination program; establish. (<i>Sen. J. Brandenburg</i>)
11	4398		Yes	3/27	3/27	3/27/13	Watercraft; marinas ; dredging material from Great Lakes bottomlands determined to be largely sand; revise permit fee. (<i>Rep. A. Price</i>)
12	4399		Yes	3/27	3/27	3/27/13	Natural resources; Great Lakes ; expedited conditional permit process; allow for emergencies. (<i>Rep. A. Pscholka</i>)
13	4400		Yes	3/27	3/27	3/27/13	Watercraft; marinas ; dredging material from inland lakes and streams determined to be largely sand; revise fee. (<i>Rep. P. Pettalia</i>)
14		019	Yes	4/16	4/16	4/16/13	Financial institutions; mortgage brokers and lenders ; appointments to the mortgage industry advisory board; modify. (<i>Sen. D. Booher</i>)
15		065	Yes	4/16	4/16	4/16/13	Individual income tax; collections ; withholding requirement for certain members of a flow-through entity; clarify. (<i>Sen. J. Brandenburg</i>)
16	4052		Yes	4/23	4/23	4/23/13 #	Trade; vehicles ; motor vehicle sales finance act; expand to include certain nonmotorized recreational vehicles. (<i>Rep. K. Kurtz</i>)
17	4053		Yes	4/23	4/23	4/23/13 #	Trade; vehicles ; application of retail installment sales act; exclude certain nonmotorized recreational vehicles. (<i>Rep. K. Kurtz</i>)
18	4045		Yes	4/23	4/23	4/23/13	Occupations; electricians ; eligible apprenticeship training programs; revise requirements for fire alarm specialty technicians. (<i>Rep. H. Crawford</i>)

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2013 Michigan Public Acts Table

PA No.	ENROLLED		I.E.* Yes/No	Governor Approved	Filed Date	Effective Date	SUBJECT
	HB	SB					
19	4123		Yes	4/23	4/23	7/1/13	Torts; liability; personal injury or property damage caused by propane gas equipment or appliances; provide protection from liability. (Rep. R. Victory)
20		0108	Yes	5/7	5/7	5/7/13	Highways; name; portion of I-94 in Kalamazoo county; designate as the "Officer Eric Zapata Memorial Highway". (Sen. T. Schuitmaker)
21		0288	Yes	5/8	5/8	5/8/13	Natural resources; hunting; natural resources commission ability to designate species as game; provide for. (Sen. T. Casperson)
22		0289	Yes	5/8	5/8	5/8/13	Natural resources; hunting; right to hunt and fish; provide for. (Sen. T. Casperson)
23	4093		Yes	5/9	5/9	5/9/13 #	Crimes; intoxication or impairment; alcohol content for individuals operating a vehicle under the influence of alcoholic liquor; maintain at 0.08 without reversion to 0.10. (Rep. A. LaFontaine)
24	4131		Yes	5/9	5/9	5/9/13 #	Criminal procedure; sentencing guidelines; alcohol content for individuals operating a motor vehicle under the influence of alcoholic liquor in the code of criminal procedure; maintain at 0.08 without reversion to 0.10. (Rep. K. Kesto)
25		0218	Yes	5/9	5/10	8/9/13	Economic development; tax increment financing; sunset on water resource improvement tax increment finance authority; remove, and allow dredging. (Sen. G. Hansen)
26		0123	Yes	5/9	5/10	5/10/13	State financing and management; funds; funding for purchase of land and development of certain convention facilities; provide for. (Sen. D. Hildenbrand)
27	4037		No	5/14	5/14	5/1/14	Traffic control; driver license; designation of veteran status on driver license; provide for, and allow secretary of state to report certain veteran information to certain other departments and agencies. (Rep. N. Jenkins)
28		0219	No	5/14	5/14	5/1/14	State; identification cards; veteran designation on state identification cards; allow. (Sen. D. Booher)

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2013 Michigan Public Acts Table

PA No.	ENROLLED		I.E.* Yes/No	Governor Approved	Filed Date	Effective Date	SUBJECT
	HB	SB					
29	4471		Yes	5/16	5/16	5/16/13	Education; calendar ; exception to minimum days of pupil instruction requirement for inclement weather days; allow for 2012-2013 if minimum hours requirement is met. (Rep. P. Potvin)
30		0178	No	5/14	5/16	**	Insurance; health ; standard prior authorization methodology for prescription drugs; create a workgroup to establish and require insurers and prescribers to use after a specific date. (Sen. T. Schuitmaker)
31		0179	No	5/14	5/16	** #	Insurance; health care corporations ; standard prior authorization methodology for prescription drugs; create a workgroup to establish and require corporations and prescribers to use after a specific date. (Sen. T. Schuitmaker)
32	4054		Yes	5/14	5/16	5/16/13	Family law; other ; definition of eligible domestic relations order; modify. (Rep. K. Heise)
33		043	Yes	5/20	5/20	5/20/13	Courts; judges ; certain district court judgeships; increase, and reduce number of circuit court judgeships. (Sen. R. Jones)
34	4264		Yes	5/21	5/21	5/21/13	Criminal procedure; sentencing ; consecutive sentencing for financial exploitation of vulnerable adult; allow under certain circumstances. (Rep. T. Leonard)
35		097	Yes	5/21	5/21	8/20/13	Traffic control; civil infraction procedures ; waiver of fine for violating certain infant seat requirements; allow. (Sen. J. Proos)
36	4254		Yes	5/21	5/21	5/21/13	Vehicles; registration ; electric carriage; exempt from definition of motor vehicle and define "use a hand-held mobile telephone". (Rep. J. Walsh)
37		016	Yes	5/28	5/28	5/28/13	Natural resources; wildlife ; wildlife violator compact law; modify enforcement provisions. (Sen. H. Walker)
38	4050		Yes	6/4	6/4	6/4/13	Children; protection ; children's ombudsman to investigate victims of child abuse or neglect; expand criteria to include children who have died as a result of child abuse or neglect. (Rep. K. Kurtz)

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2013 Michigan Public Acts Table

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	HB	SB					
39	4177		Yes	6/4	6/4	6/4/13	Crimes; homicide ; reference to vulnerable adult abuse in first degree murder statute; revise. (Rep. J. Ananich)
40	4705		Yes	6/4	6/4	6/4/13	Property tax; state education tax ; reimbursement of certain levied millage revenues; allow. (Rep. E. McBroom)
41	4042		Yes	6/5	6/5	6/5/13	Human services; food assistance ; criteria for the issuance of Michigan bridge cards; modify. (Rep. T. Kelly)
42		051	Yes	6/6	6/6	6/6/13	Property tax; classification ; qualified forest property tax program; modify. (Sen. D. Booher)
43		054	Yes	6/5	6/6	6/6/13	Property tax; classification ; allocation of qualified forest property recapture tax; modify. (Sen. T. Casperson)
44		055	Yes	6/5	6/6	6/6/13	Property tax; exemptions ; definition of qualified agricultural property; revise. (Sen. M. Green)
45		056	Yes	6/5	6/6	6/6/13	Natural resources; forests ; private forest management; provide oversight from the department of agriculture and rural development and provide for conservation district assistance to owners of forestland. (Sen. D. Booher)
46		057	Yes	6/5	6/6	6/6/13	Agriculture; other ; Michigan agriculture environmental assurance program; expand to include lands not utilized for traditional or production agriculture such as forest management. (Sen. A. Meekhof)
47		058	Yes	6/5	6/6	6/6/13	Natural resources; forests ; promotion of forestry and the development of the forest products industry in the state; provide for. (Sen. J. Moolenaar)
48	4069		Yes	6/5	6/6	6/6/13	Natural resources; forests ; classification of forestland as commercial forest; clarify requirements for inclusion and withdrawal of forestland. (Rep. F. Foster)

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2013 Michigan Public Acts Table

PA No.	ENROLLED		I.E.* Yes/No	Governor Approved	Filed Date	Effective Date	SUBJECT
	HB	SB					
49	4243		Yes	6/5	6/6	6/6/13	Property tax; other; qualified forest property recapture tax; revise. (Rep. E. McBroom)
50	4244		Yes	6/5	6/6	6/6/13	Property tax; classification; qualified forest property; revise exemption. (Rep. B. Rendon)
51	4171		Yes	6/11	6/11	6/11/13 #	Elections; canvassing; elimination of local boards of canvassers and amendment of process to balance precinct results; provide for, and clarify allocation of costs to conduct village elections. (Rep. B. Jacobsen)
52	4169		Yes	6/11	6/11	6/11/13 #	Elections; canvassing; reference in general law village act to board of village canvassers and board of township canvassers; revise to board of county canvassers. (Rep. D. Pagel)
53	4170		Yes	6/11	6/11	6/11/13 #	Elections; canvassing; reference in community college act of 1966 to board of city or township canvassers; eliminate. (Rep. K. Cotter)
54	4127		Yes	6/11	6/11	6/11/13	Criminal procedure; probation; GPS bail monitoring of certain offenders; allow. (Rep. J. Johnson)
55	4360		Yes	6/11	6/11	9/10/13	Liquor; licenses; penalties for certain unauthorized transactions for food assistance or family independence program benefits; provide for. (Rep. G. Haines)
56	4361		Yes	6/11	6/11	9/10/13	Gaming; lottery; lottery sales agent; provide for penalties for fraudulent activity related to food assistance benefits. (Rep. R. Victory)
57		0165	Yes	6/11	6/11	9/10/13	Health facilities; hospitals; policy regarding life-sustaining or nonbeneficial treatment; require policy be disclosed in writing upon request and provide to parent or guardian if it applies to a minor or ward. (Sen. J. Marleau)
58		0335	Yes	6/11	6/11	6/11/13	Insurance; health; health insurance claims assessment; extend the sunset. (Sen. R. Kahn)

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2013 Michigan Public Acts Table

PA No.	ENROLLED		I.E.* Yes/No	Governor Approved	Filed Date	Effective Date	SUBJECT
	HB	SB					
59	4328		Yes	6/13	6/13	6/13/13 +	Appropriations; other; omnibus budget bill for fiscal year 2013-2014; provide for. (Rep. J. Haveman)
60	4228		Yes	6/13	6/13	6/13/13	Appropriations; school aid; fiscal year 2013-2014 omnibus appropriations for school aid, higher education, and community colleges; provide for. (Rep. B. Rogers)
61	4458		Yes	6/16	6/18	6/18/13	Economic development; tax increment financing; capture of increased tax revenue levied under certain tax millages; prohibit. (Rep. E. Kowall)
62	4461		Yes	6/16	6/18	6/18/13	Economic development; local development financing authority; capture of increased tax revenue levied under certain millages; prohibit. (Rep. H. Haugh)
63	4463		Yes	6/16	6/18	6/18/13	Economic development; other; capture of increased tax revenue levied under certain millages; prohibit. (Rep. J. Walsh)
64	4464		Yes	6/16	6/18	6/18/13	Economic development; other; capture of increased tax revenue levied under certain millages; prohibit. (Rep. G. Haines)
65	4743		Yes	6/19	6/19	6/19/13	Fireworks; use; local control of consumer fireworks use; expand, and amend certain licensing requirements. (Rep. H. Haugh)
66	4459		Yes	6/19	6/19	6/19/13	Economic development; downtown development authorities; capture of increased tax revenue levied for certain millages; prohibit. (Rep. J. Townsend)
67	4460		Yes	6/19	6/19	6/19/13	Economic development; brownfield redevelopment authority; capture of increased tax revenue levied under certain millages; prohibit. (Rep. P. Cavanagh)
68	4462		Yes	6/19	6/19	6/19/13	Economic development; corridor improvement; capture of increased tax revenue levied under certain millages; prohibit. (Rep. J. Farrington)

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2013 Michigan Public Acts Table

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	HB	SB					
69	4591		Yes	6/25	6/25	6/25/13	Occupations; alarm systems; installation of certain home monitoring systems without electrician's permit; authorize for registered or licensed security alarm providers. (Rep. A. Nesbitt)
70	4737		Yes	6/25	6/25	6/25/13	Construction; permits; installation, maintenance, replacement, or servicing of a home monitoring system; exempt from construction code permit requirements. (Rep. A. Nesbitt)
71	4592		Yes	6/25	6/25	6/25/13	Occupations; mechanical contractors; installation of certain home thermostats under Forbes mechanical contractors act; authorize for security alarm system providers. (Rep. B. Jacobsen)
72	4665		Yes	6/25	6/25	6/25/13	Environmental protection; solid waste; solid waste surcharge program; extend sunset. (Rep. E. Kowall)
73	4666		Yes	6/25	6/25	10/1/13	Environmental protection; hazardous waste; sunset for certain user charges; extend, and consolidate funds. (Rep. E. Kowall)
74	4708		Yes	6/25	6/25	10/1/13	Environmental protection; hazardous waste; hazardous materials transportation permit fund; replace with environmental pollution prevention fund. (Rep. E. Kowall)
75	4669		Yes	6/25	6/25	6/25/13	Vehicles; off-road; license fee for off-road vehicles; revise. (Rep. J. Bumstead)
76		0256	Yes	6/25	6/25	6/25/13	Economic development; other; Michigan supply chain management development commission revisions; provide for. (Sen. M. Kowall)
77	4303		Yes	6/27	6/27	9/26/13	Occupations; mortuary science; courtesy licenses for licensees from certain other states; authorize for certain purposes. (Rep. K. Kurtz)
78	4329		Yes	6/27	6/27	9/26/13 #	Occupations; licensing fees; fees for courtesy mortuary science licenses; establish. (Rep. K. Kurtz)

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2013 Michigan Public Acts Table

PA No.	ENROLLED		I.E.* Yes/No	Governor Approved	Filed Date	Effective Date	SUBJECT
	HB	SB					
79	4330		Yes	6/27	6/27	9/26/13 #	Occupations; mortuary science; authorization of death record by funeral director who holds a courtesy license; allow. (Rep. K. Kurtz)
80	4574		Yes	6/27	6/27	9/26/13	Occupations; mortuary science; assignment or assumption of prepaid funeral contracts by purchaser of a licensed funeral establishment; require. (Rep. K. Kurtz)
81	4297		No	6/27	6/28	5/1/14 #	Recreation; state parks; waiver of recreation passport fees; allow for holders of multiyear vehicle registrations except when registration fee is paid. (Rep. F. Foster)
82	4439		No	6/27	6/28	5/1/14 #	Vehicles; registration; recreational passport fee; eliminate from registration forms for certain military specialty plates. (Rep. F. Foster)
83	4080		Yes	6/27	6/28	6/28/13	Property; conveyances; surplus department of corrections property in Kinross township and Camp Manistique in Schoolcraft county; provide for conveyance. (Rep. F. Foster)
84	4307		Yes	6/27	6/28	6/28/13	Elections; special elections; requirement for a special election when a vacancy occurs in the office of county commissioner during an odd numbered year; eliminate unless the vacancy is not filled by appointment. (Rep. L. Lyons)
85	4540		Yes	6/27	6/28	6/28/13	Economic development; plant rehabilitation; taxation of certain industrial facilities exemption certificates; clarify. (Rep. J. Stamas)
86	4663		Yes	6/27	6/28	6/28/13	Water; conservation; agricultural land uses; modify water withdrawal dispute resolution process and allowable expenditures from the agricultural preservation fund. (Rep. K. Daley)
87		0264	Yes	6/27	6/28	6/28/13	Natural resources; other; issuance of permits for dredging; modify procedure. (Sen. T. Casperson)
88	4082		Yes	6/28	6/28	6/28/13 #	Individual income tax; other; Michigan Alzheimer's association fund act; create. (Rep. M. Lori)

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2013 Michigan Public Acts Table

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	HB	SB					
89	4084		Yes	6/28	6/28	6/28/13	Individual income tax; other ; ALS of Michigan ("Lou Gehrig's disease") fund act; create. (Rep. J. Farrington)
90		0150	Yes	6/28	6/28	6/28/13 #	Individual income tax; checkoff ; contribution to Michigan Alzheimer's association fund; provide for check-off option. (Sen. J. Pappageorge)
91		0341	Yes	6/28	6/28	6/28/13 #	Individual income tax; other ; Michigan Amber alert fund; create. (Sen. D. Hildenbrand)
92		0342	Yes	6/28	6/28	6/28/13	Individual income tax; checkoff ; contributions to Michigan Amber alert fund; provide check-off option. (Sen. D. Hildenbrand)
93	4529		Yes	7/1	7/1	7/1/13	Criminal procedure; defenses ; statewide standards and accountability measures of trial-level indigent criminal defense services; implement, and create the Michigan indigent defense commission act. (Rep. T. McMillin)
94		0301	Yes	7/1	7/1	7/1/13 #	Criminal procedure; other ; appointment of counsel to indigent person charged with felony; modify. (Sen. B. Caswell)
95		0284	Yes	7/1	7/1	7/1/13	Public utilities; other ; creation and funding of the low-income energy assistance fund; provide for. (Sen. M. Nofs)
96	4813		Yes	7/2	7/2	7/2/13 #	Education; reorganization ; criteria and procedures for dissolution of a school district; revise. (Rep. B. Rogers)
97	4815		Yes	7/2	7/2	10/1/13 #	School aid; other ; implementation of district dissolution; provide for in school aid act, and adjust appropriations for districts affected by dissolution. (Rep. B. Rogers)
98		0163	Yes	7/2	7/2	7/2/13	Natural resources; wetlands ; permit exemptions for wetlands and inland lakes and streams; revise, modify certain permit fees, provide for certain general permits, and require more information from department justifying denial of any part 13 permits. (Sen. M. Green)

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++ - Pocket veto.

- Tie bar.

2013 Michigan Public Acts Table

PA No.	ENROLLED		I.E.* Yes/No	Governor Approved	Filed Date	Effective Date	SUBJECT
	HB	SB					
99		0175	Yes	7/2	7/2	7/2/13	Military affairs ; generally, Michigan military act; modify. (<i>Sen. J. Pappageorge</i>)
100		079	Yes	7/2	7/2	8/31/13	Liquor ; licenses; farmer's market permit to sell and taste wine at farmer's market; provide for. (<i>Sen. G. Hansen</i>)
101		027	Yes	7/2	7/2	7/2/13 #	Liquor ; licenses; ability to refill growlers of beer and to sample and sell wine at farmer's market; provide for certain licensees. (<i>Sen. D. Hildenbrand</i>)
102	4112		Yes	7/3	7/3	7/3/13	Appropriations ; zero budget; supplemental appropriations; provide for fiscal years 2012-2013 and 2013-2014. (<i>Rep. J. Haveman</i>)
103		0380	Yes	7/3	7/3	7/3/13 #	Civil procedure ; foreclosure; mortgage modification program; revise. (<i>Sen. R. Richardville</i>)
104		0383	Yes	7/3	7/3	1/10/14 #	Civil procedure ; foreclosure; redemption period; terminate redemption rights if property is damaged. (<i>Sen. D. Booher</i>)
105	4765		Yes	7/3	7/3	7/3/13 #	Civil procedure ; foreclosure; mortgage modification program; extend sunset and phase out. (<i>Rep. J. Farrington</i>)
106	4766		Yes	7/3	7/3	7/3/13 #	Civil procedure ; foreclosure; mortgage modification; require certain mortgage servicing agents to personally meet with mortgagors. (<i>Rep. M. Callton</i>)
107	4714		No	9/16	9/16	**	Human services ; medical services; medicaid eligibility expansion; provide for, and sunset under certain conditions. (<i>Rep. M. Lori</i>)
108	4668		Yes	9/17	9/17	9/17/13	Natural resources ; hunting; base license; create, and modify hunting and fishing licenses and fees. (<i>Rep. J. Bumstead</i>)

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2013 Michigan Public Acts Table

PA No.	ENROLLED		I.E.* Yes/No	Governor Approved	Filed Date	Effective Date	SUBJECT
	HB	SB					
109	4670		Yes	9/24	9/24	9/24/13	State financing and management; funds; disaster and emergency contingency fund; establish. (Rep. M. McCready)
110		0330	Yes	9/24	9/24	9/24/13	State financing and management; funds; disaster and emergency contingency fund; establish. (Sen. T. Casperson)
111	4094		Yes	9/24	9/24	9/24/13	Natural resources; hunting; punishment for lawfully hunting, taking game, or possessing game that was lawfully taken in another state; prohibit. (Rep. J. Johnson)
112	4664		Yes	9/24	9/24	9/24/13	Retirement; state employees; retired corrections officers to work as needed; extend sunset. (Rep. G. MacMaster)
113	4671		Yes	9/24	9/24	9/24/13	Communications; emergency 9-1-1; distribution of service charge fees for 9-1-1; revise. (Rep. E. Poleski)
114	4132		Yes	9/24	9/24	9/24/13	Natural resources; soil and erosion; membership on a conservation district board; allow temporary appointments to fill vacancies under certain circumstances. (Rep. P. Pettalia)
115	4541		Yes	9/24	9/24	9/24/13	Economic development; obsolete property and rehabilitation; application approval for previous tax year; allow under certain circumstances. (Rep. T. Kelly)
116		0347	Yes	9/24	9/24	9/24/13	Housing; housing development authority; surplus funds; authorize investment in multifamily housing projects or to make loans for such projects. (Sen. M. Jansen)
117	4284		Yes	9/25	9/25	9/25/13	Highways; local; off-road vehicle shoulder access on state trunk line highways; allow under certain circumstances. (Rep. J. Johnson)
118	4299		Yes	9/25	9/25	9/25/13	Natural resources; other; counties eligible to authorize off-road vehicles on road shoulders; extend to entire state and eliminate sunset. (Rep. J. Bumstead)

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2013 Michigan Public Acts Table

PA No.	ENROLLED		I.E.* Yes/No	Governor Approved	Filed Date	Effective Date	SUBJECT
	HB	SB					
119		050	Yes	9/25	9/25	9/25/13	Natural resources; other; operation of off-road vehicles on certain state highways; provide for. (Sen. T. Casperson)
120		0237	Yes	10/1	10/1	10/1/13 #	Health; immunizations; grade requirement for certain immunization records; modify in public health code. (Sen. J. Marleau)
121		0238	Yes	10/1	10/1	10/1/13 #	Education; attendance; grade requirement for certain immunization records; modify in school code. (Sen. R. Warren)
122		0239	Yes	10/1	10/1	10/1/13 #	Education; attendance; grade requirement for certain immunization records; modify in school aid act. (Sen. J. Emmons)
123		0357	Yes	10/1	10/1	10/1/13	Businesses; business corporations; shareholder vote requirement for certain business combinations; revise. (Sen. J. Pappageorge)
124	4525		Yes	10/1	10/1	10/1/13	Criminal procedure; sentencing guidelines; sentencing guidelines for certain crimes; modify crime class, correct crime descriptions, and provide sentencing guidelines for certain crimes. (Rep. J. Graves)
125	4732		Yes	10/1	10/1	10/1/13	Construction; code; plumbing fixture and electrical power requirements; exempt agricultural roadside sale stands. (Rep. G. MacMaster)
126		0257	Yes	10/8	10/9	10/9/13	Economic development; other; business improvement districts; modify. (Sen. M. Kowall)
127	4613		Yes	10/8	10/9	10/9/13	Housing; landlord and tenants; requirement for lawful reentry by landlord; modify in case of death of tenant. (Rep. M. O'Brien)
128		0162	Yes	10/8	10/9	10/9/13	Courts; jurisdiction; jurisdiction for prosecution of felony offenses; expand to include county where consequence intended to have effect. (Sen. M. Nofs)

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2013 Michigan Public Acts Table

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	HB	SB					
129		0126	Yes	10/8	10/9	10/9/13	Appropriations ; zero budget; supplemental appropriations; provide for fiscal year 2012-2013. (<i>Sen. R. Kahn</i>)
130	4229		Yes	10/8	10/9	10/9/13	Appropriations ; school aid; technical revisions to school aid budget; provide for fiscal year 2013-2014. (<i>Rep. J. Haveman</i>)
131	4334		Yes	10/15	10/15	10/15/13	Businesses ; limited liability companies; ownership requirements for professional limited liability companies engaged in practice of public accounting; revise. (<i>Rep. T. McMillin</i>)
132	4654		Yes	10/15	10/15	10/15/13	Businesses ; business corporations; ownership requirements for professional corporations engaged in practice of public accounting; revise. (<i>Rep. E. Poleski</i>)
133	4002		Yes	10/15	10/15	10/15/13	Taxation ; administration; interest rate for certain refunds; increase. (<i>Rep. M. Shirkey</i>)
134	4355		Yes	10/15	10/15	1/14/14	Housing ; condominium; auditing requirements; modify. (<i>Rep. P. Clemente</i>)
135	4586		Yes	10/15	10/15	10/15/13	State financing and management ; other; voluntary disclosure agreement; revise. (<i>Rep. P. Somerville</i>)
136	4786		Yes	10/15	10/15	10/15/13	Health ; vital records; vital records fees; modify, and create a vital records fund. (<i>Rep. M. Lori</i>)
137	4787		Yes	10/15	10/15	10/15/13	Health facilities ; certificate of need; fees and assessments; modify. (<i>Rep. M. Lori</i>)
138	4961		Yes	10/15	10/15	10/15/13	Human services ; other; contributions for administrative services; modify. (<i>Rep. P. MacGregor</i>)

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	HB	SB					
139	4636		Yes	10/22	10/22	10/22/13	Crime victims; rights ; requirement for paying restitution to deceased crime victim; clarify. (Rep. T. Leonard)
140		025	Yes	10/22	10/22	10/22/13	Property tax; principal residence exemption ; appeal process for principal residence exemption; revise. (Sen. D. Hildenbrand)
141		0351	Yes	10/22	10/22	10/22/13	Environmental protection ; cleanups; fertilizers and other soil conditioners; clarify that appropriate application is not a release. (Sen. A. Meekhof)
Veto	4085		Yes	No	6/28	6/28/13	Individual income tax; checkoff ; funding for ALS of Michigan ("Lou Gehrig's disease") fund; create. (Rep. T. Cochran)

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